U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-285 540

Suspended Sediment in the Chesapeake and Delaware Canal

State Univ of New York at Stony Brook

Prepared for

Environmental Protection Agency, Philadelphia, Pa Chesapeake Bay Program

PB 285 540

SUSPENDED SEDIMENT IN THE CHESAPEAKE AND DELAWARE CANAL

J.R. SCHUBEL
A.D. WILLIAMS
W.M. WISE

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

SPECIAL REPORT 11

REFERENCE 77-7

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA 903/9-78-013	2.
3. RECIPIENT'S ACCESSION NO. PB285540	
4. TITLE AND SUBTITLE "Suspended Sediment in the Chesapeake & Delaware Canal"	5. REPORT DATE October 11, 1977
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J. R. Schubel, A. D. Williams, and W. M. Wise	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Marine Sciences Research Center State University of New York Stony Brook, NY 11794	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO. WD-699-1038J
12. SPONSORING AGENCY NAME AND ADDRESS Chesapeake Bay Program, U. S. EPA Region III, 6th & Walnut Streets Philadelphia, PA 19106	13. TYPE OF REPORT AND PERIOD COVERED Final, 6/1/77-8/31/77
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The research concentrated on the effect of suspended sediment on the mortality of fish larvae of striped bass and white perch in the Chesapeake & Delaware Canal.

Data includes the average suspended sediment concentration (mg/l), delay in incubated egg hatching, effects of suspended sediment on the mortality of fish larvae, and a summary of suspended sediment observations made during dredging.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Sediment transport Fishes	Spawning area Larvae Egg Hatching Nursery area Chesapeake & Delaware Canal	

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS *(This Report)* UNCLASSIFIED	21. NO. OF PAGES 80
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE A05-A01

EPA Form 2220-1 (9-73)

MARINE SCIENCES RESEARCH CENTER
STATE UNIVERSITY OF NEW YORK
STONY BROOK, NEW YORK 11794

SUSPENDED SEDIMENT IN THE CHESAPEAKE AND DELAWARE CANAL

J. R. Schubel
A. D. Williams
W. M. Wise

October 1977

Special Report 11
Reference 77-7

ia

Approved for Distribution
J. R. Schubel
J. R. Schubel, Director

TABLE OF CONTENTS

	Page
LIST OF FIGURES	ii
LIST OF TABLES	iii
ACKNOWLEDGEMENTS	iv
INTRODUCTION	1
THE CHESAPEAKE AND DELAWARE CANAL: AN HISTORICAL PERSPECTIVE	1
HYDROGRAPHY OF THE CHESAPEAKE AND DELAWARE CANAL	6
DISTRIBUTION OF SUSPENDED SEDIMENT, TEMPERATURE AND SALINITY	8
Introduction	8
Methods	9
Suspended Sediment	9
Salinity and Temperature	9
Weather	10
Time	10
The Observations	10
Suspended Sediment	10
Observations During Dredging	16
SOME COMMENTS ON FISH EGGS AND LARVAE IN THE CANAL AND THE EFFECTS OF SUSPENDED SEDIMENT ON THEIR SURVIVAL AND DEVELOPMENT	16
Fish Eggs and Larvae	16
Striped Bass Spawning, Eggs, and Larvae in the C & D Canal	18
White Perch Spawning, Eggs, and Larvae in the C & D Canal	19
Effects of Suspended Sediment Concentrations Characteristic of the Canal on Fish Eggs and Larvae	19
Review of Literature on Effects of Suspended Sediment on Fish Eggs and Larvae	20
Effects of Suspended Sediment on Hatching Success of Fish Eggs	21
Effects of Suspended Sediment on Rates of Fish Egg Development	23
Effects of Suspended Sediment on Fish Larvae	24
Summary	27
LITERATURE CITED	28
APPENDIX A	30

LIST OF FIGURES

Figure		Page
1	Regional setting	1
2	Upper and lower Canal routes (from Gray, 1967)	2
3	Volume of improvement dredging in Chesapeake and Delaware Canal, 1921-1976	5
4	Volume of maintenance dredging in Chesapeake and Delaware Canal, 1921-1976	5
5	Volume of maintenance dredging in Chesapeake and Delaware Canal, 1928-1972, by five-year rolling average	6
6	Chart of Chesapeake and Delaware Canal showing location of temperature, salinity and suspended sediment stations	8
7	Distribution of suspended sediment (mg/ℓ) on 11 March 1971	11
8	Distribution of suspended sediment (mg/ℓ) on 23 March 1971	11
9	Distribution of suspended sediment (mg/ℓ) on 25 March 1971	11
10	Distribution of suspended sediment (mg/ℓ) on 30 March 1971	12
11	Distribution of suspended sediment (mg/ℓ) on 18 August 1971	12
12	Distribution of suspended sediment (mg/ℓ) on 27 August 1971	12
13	Distribution of suspended sediment (mg/ℓ) on 30 August 1971	13
14	Distribution of suspended sediment (mg/ℓ) on 8 September 1971	13
15	Distribution of suspended sediment (mg/ℓ) on 19 October 1971	13
16	Distribution of suspended sediment (mg/ℓ) on 16 November 1971	14
17	Distribution of suspended sediment (mg/ℓ) on 14 December 1971	14
18	Distribution of suspended sediment (mg/ℓ) on 27 January 1972	14
19	Distribution of suspended sediment (mg/ℓ) on 28 February 1972	15
20	Distribution of suspended sediment (mg/ℓ) on 14 February 1973	15
21	Distribution of suspended sediment (mg/ℓ) on 5 October 1976. The bottom topography indicated in the figure has not been corrected for removal of the "plug" in the eastern end of the Canal which was completed in March 1975	15
22	Spillway, showing discharge entering north side of the Canal	16

LIST OF TABLES

Table		Page
1	Cruise Summary: Cruise Number; Date; Direction, and Stage of Tidal Current For Each of the Cruises	9
2	Summary of Suspended Sediment Observations During Dredging on 20-21 May 1971	17
3	Average Suspended Sediment Concentrations (mg/ℓ) Observed in March 1971	20
4	Minimum and (Maximum) Suspended Sediment Concentrations (mg/ℓ) Observed in 1971	21
5	Delay in Hatching of Eggs Incubated in Suspensions of Natural Fine-Grained Sediments	23
6	Effects of Suspended Sediment on Mortality of Fish Larvae	24
7	Effects of Suspended Sediment on Mortality of Fish Larvae	25
8	Effects of Suspended Sediment on Mortality of Fish Larvae	26

ACKNOWLEDGEMENTS

We are indebted to C. H. Morrow, G. M. Schmidt, and T. W. Kana for assisting in the collection of data, to H. H. Carter for information on hydrography, to Carol-Lee Igoe and Virginia Sewell for typing the report, and to Carol Cassidy for drafting the figures.

Partial support for the data collection program was provided by a project jointly funded by the Fish and Wildlife Administration of the State of Maryland, and the National Marine Fisheries Service, Department of Commerce, through Public Law 89-304 funds.

Preparation of the report was supported by the Chesapeake Bay Program, Environmental Protection Agency, Region III; and the Rockefeller Foundation.

INTRODUCTION

From March 1971 through February 1972 the senior author collected samples of suspended sediment at a series of stations along the axis of the Chesapeake and Delaware Canal. On each cruise several stations were also occupied in the approaches to the Canal in the Chesapeake Bay and in the Delaware Bay. The collection program was done in conjunction with studies by Pritchard and Gardner (1974).

The primary purposes of this report are: to briefly review the dredging history of the Chesapeake and Delaware Canal, to summarize our suspended sediment observations in tabular and graphical form, and to assess the biological implications of the observed suspended sediment distribution patterns.

THE CHESAPEAKE AND DELAWARE CANAL: AN HISTORICAL PERSPECTIVE

The idea of building a canal across the upper Delmarva Peninsula dates to the 17th century. Early colonists realized the potential advantages to connecting of Delaware and Chesapeake Bays by a canal between peninsular streams, separated in places by no more than a few miles of relatively flat land, Fig. 1. It was not until the mid-18th century, however, that the idea was taken seriously, and formation of a concerted movement to sponsor the project in the legislatures of Maryland, Pennsylvania and Delaware was delayed until the end of the century.

In 1802 the Chesapeake and Delaware Canal Company was organized. Construction of the Canal began in 1804. The route chosen was supposed to run from the Elk River towards Christiana, Delaware, ending either at the Delaware or Christian Rivers, Fig. 2. Construction began at the

Fig. 1. Regional setting.

western entrance at Welsh Point on the Elk River. The Canal Company ran out of money in 1805, with only portions of the western section completed. For the next twenty years no work was performed. The Federal government was persuaded to provide financial aid in the 1820's through purchasing a large number of shares of the Company. Construction resumed in 1824, but with a change of route.

The Canal was now to run from the Delaware River at Newbold's Landing through to Back Creek with a tide lock at the mouth of Long Creek, Fig. 2. Total length of the Canal was to be 13.6 mi.[1] with two tide and two lift locks. The original dimensions of the project called for the Canal to be 66 ft. wide at the top of the channel, 36 ft. wide at the bottom of the channel, and 10 ft. deep. Passing places were to be constructed at half-mile intervals except in the "Deep Cut" section (the Summit region) where they were spaced one mile apart. A harbor was constructed at Newbold's Landing, later renamed Delaware City. The dimensions of the locks were 100 ft. long by 22 ft. wide (Gray, 1967).

The Chesapeake and Delaware Canal was opened in 1829. Because of the enormous expense of the construction ($165,000/mi. versus $19,000/mi. for the Erie Canal), protracted delays in raising money, and conflicts over management, the Canal Company was in serious financial difficulties before the waterway opened for business.

The Canal was an immediate success as a freight carrier. The new route, which shortened the trip to Philadelphia by about 300 mi., enabled towboat and later steamboat lines to develop in the upper Chesapeake Bay - Susquehanna Valley region. Most of the traffic using the Canal went from west to east, carrying freight primarily to Philadelphia.

As early as the 1830's the Company encountered difficulties in maintaining

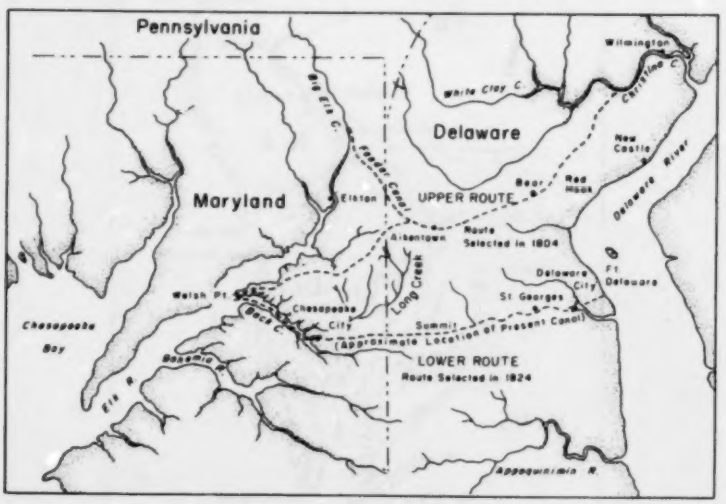

Fig. 2. Upper and lower Canal routes (from Gray, 1967).

the Canal. Landslides from unstable sides of the channel were a continual problem, and the Company purchased its first dredge to remove shoals during this period. The Company, always barely solvent, was rarely able to secure funds for channel and lock maintenance. This exacerbated the fact that the dimensions of the Canal were outdated soon after it opened. Improvement of the Canal to accommodate increasingly larger vessels was beyond the resources of the Company. The sometimes unnavigable conditions diverted a significant amount of traffic away from the route. Steamboats occasionally were barred because of the damage they caused to the sides of the channel.

A direct rail route, running parallel to the Canal, between Baltimore and Philadelphia, was completed in the 1840's. Competition for freight and passengers by this line cut the Company's revenues substantially. This in turn reduced the Company's ability to maintain the channel in order to compete successfully with the railroad. This competition was the ultimate downfall of the Canal Company and eventually led to its purchase by the Federal government.

The first improvements to the Canal were suggested in the 1840's. All that was accomplished, however, was enlargement of the locks, the size of which effectively limited the size of vessels using the route. Because of a perpetual lack of money, no significant improvement work was ever performed on the Canal while under private ownership.

Most inland waterways carried peak tonnages during the 1850's, and by the 1870's all but the best situated were in decline. Railroads were the backbone of commercial transportation, and popular support for Canal improvements was small. The Chesapeake and Delaware Canal carried its greatest tonnages in the 1870's, after which business declined until Federal improvements were made.

The necessity of an adequate ship channel through the peninsula was, however, never clearer than during the Civil War and in the years to follow. The C & D Canal proved vital to the survival of Washington, D. C. because rail routes to the Capital led through pro-southern cities, such as Baltimore. President Lincoln later declared that the Canal had saved the Union.

The depression which followed the war sealed the fate of the Canal as a private enterprise. While the commercial traffic through Baltimore and its Port grew rapidly, traffic through the Canal continued to decline. Although more than 80% of the traffic on the Canal during the 1880's was eastbound, most of the important traffic from Baltimore, especially the larger barges carrying coal and grains, was forced to travel around the coast to reach other cities and foreign ports.

Southern commercial shipping interests began to demand a sea level ship canal through the peninsula in the 1870's. This for the most part reflected the growth of Baltimore as an export point to foreign countries. Expectation that either private interests or the Federal government would construct a 30 - 35 mi. long canal, through a more southern region of the peninsula, discouraged considerations of improving the C & D Canal after the 1870's.

Investigations and surveys for the new Canal went on for decades. It was ultimately realized that use of the Chesapeake and Delaware Canal would depend mainly on traffic through the Port of Baltimore. Thus the more southern and lengthy of the proposed routes were eliminated. This realization reawakened interest in the possibility of Federal improvement of the C & D Canal. This had been proposed many times in the 19th century, as the military importance of the Canal had been established, and as the Federal government was a major shareholder of the Company. Purchase of the Canal by the Federal government finally occurred in

1919.

The Canal had deteriorated badly in the years preceding its purchase. Up to 1919 it was capable only of transporting vessels with 750 tons cargo, about half the capacity of the modern vessels in use at that time. A great deal of maintenance and preliminary work was required before large scale improvement began in 1922. The dimensions of the Canal as a Federal project called for the Canal to be 12 ft. deep at mean low water, and 90 ft. wide at the bottom. A new eastern entrance to the Canal was designated at Reedy Pt., Delaware, 2 mi. south of the entrance at Delaware City.

Conversion to a lockless sea level Canal was not made immediately. The enlargement as noted above was made as an interim step to the final construction. The locks were removed in 1927, completing the transition to a sea level Canal. Over 16,000,000 yds.^{3} of material were excavated for this initial improvement.

The second major congressional authorization for further improvements occurred in 1935. New project dimensions stipulated a channel 27 ft. deep and 250 ft. wide from Delaware River to the Elk River, with a 400 ft. wide channel to deep water near Pooles Island in Chesapeake Bay. The dimensions of the Delaware City Branch Channel (the original eastern terminus) were set at 8 ft. deep and 50 ft. wide. Other improvements were authorized for enlargement of anchorages and basins at both ends of the Canal.

Work to complete these improvements continued until 1941. Approximately 35,000,000 yds.^{3} of material were removed from the Canal. Most dredging was accomplished by pipeline dredge. During this work sides were reduced in slope and stabilized, thus reducing somewhat the persistent problem of slippage into the Canal. Extensive work was done on bank stabilization in the 1940's, requiring dry excavation of 4,000,000 yds.^{3} of earth and installation of miles of drainage pipes and over 50,000 tons of riprap. The continual problem of shoaling at the Reedy Point entrance was alleviated in 1942 by extension of a jetty.

Improvement work on the 25 mi. long approach channel in Chesapeake Bay began in 1936. Hopper dredges were used to dig a channel 27 ft. deep by 400 ft. wide. This work continued until 1938 and produced over 24,000,000 yds.^{3} of spoil which was deposited in diked areas next to Pearce Creek.

The last improvements were authorized by Congress in 1954. These included the deepening of the channel to 35 ft. at mean low water and widening the bottom of the channel to 450 ft. Other improvements authorized pertained to bridges and increasing the radius of curvature at all bends to not less than 7,000 ft. A new cut-off channel was specified at the Lorewood section of the Canal.

Dredging under this authorization did not begin until 1962. By 1970 when enlargement was about 80% completed, substantial concerns were expressed by a variety of groups on possible deleterious effects of enlargement: on the net transport of water through the Canal, on velocities and turbulence within the Canal, on the salinity regime of the upper Chesapeake Bay, on the biological populations of the Canal and contiguous regions, and on the environment of the upper Chesapeake Bay. A series of extensive field and laboratory studies was initiated to assess the environmental and biological effects of enlargement (Chesapeake Biological Laboratory et al., 1972 and Appendices), and dredging of the east end of the Canal was restricted, leaving a "plug". The "plug" was to be completely removed only if the studies demonstrated that the effects of the proposed enlargement would be "acceptable" (Cronin et al., 1977). Removal of the "plug" was completed in March of 1975. Between 1962 and 1975, over 50,000,000 yds.^{3} of material were removed for improvement work from

all project areas, almost all of it by hydraulic pipeline dredge. The material was disposed of on fastlands bordering the Canal. The amount of material dredged for improvement (new work) between 1919 and 1976 is summarized in Fig. 3.

The amount of material dredged for maintenance purposes since 1919 is illustrated in Fig. 4. Almost all *maintenance* work done in the Canal has been performed by hopper dredges, and the spoil has been deposited on adjacent land and behind

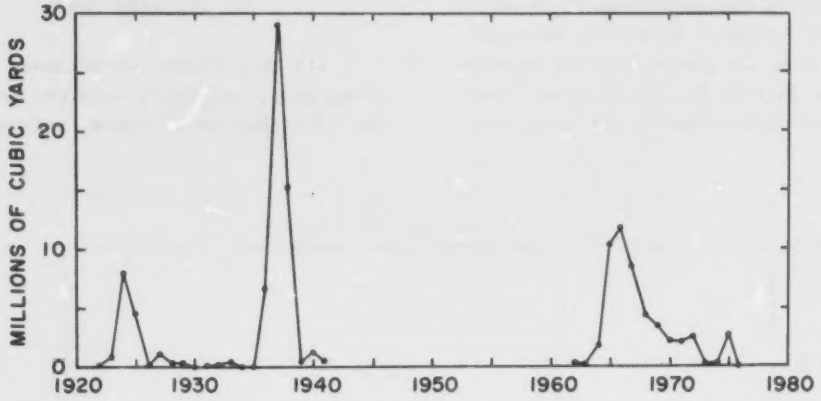

Fig. 3. Volume of improvement dredging in Chesapeake and Delaware Canal, 1921-1976.

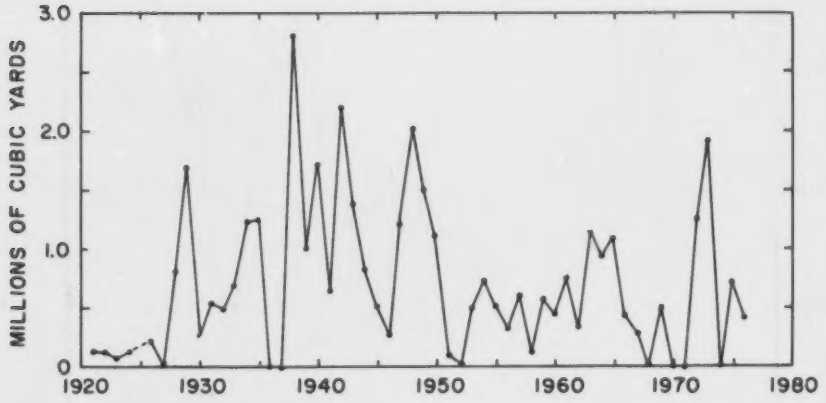

Fig. 4. Volume of maintenance dredging in Chesapeake and Delaware Canal, 1921-1976.

diked disposal areas. During the Federal fiscal years 1942 - 1961, inclusive, a period when no *improvement* dredging was done, approximately 800,000 yds.[3] were dredged yearly for maintenance work from all areas of the project. From 1962 to 1975, inclusive, over which time improvement dredging was almost constantly in progress, the average yearly amount of material removed for maintenance was about 650,000 yds.[3] A graph of yearly maintenance dredging by five-year rolling average is presented in Fig. 5. It is clear that the increased dimensions of the Canal and approach channel have added significantly to maintenance dredging requirements.

---

[1]British Engineering Units are used in this section to conform with standard engineering practice.

HYDROGRAPHY OF THE CHESAPEAKE AND DELAWARE CANAL

The Chesapeake and Delaware Canal is a man-made, sea level waterway connecting two tidal bodies of water, Delaware Bay

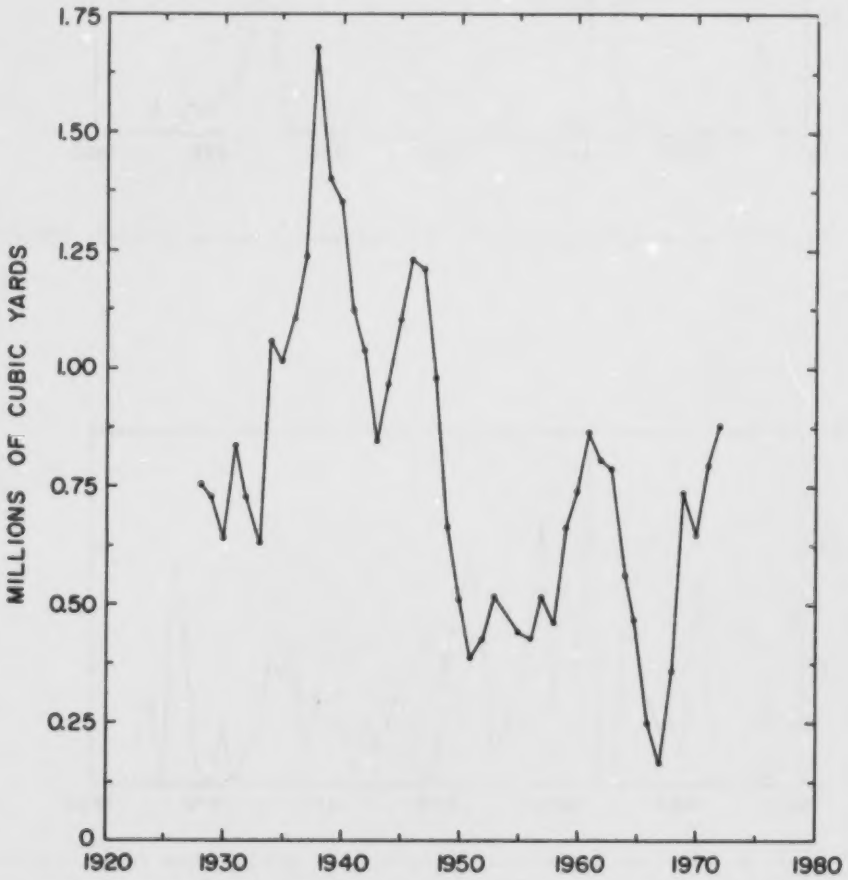

Fig. 5. Volume of maintenance dredging in Chesapeake and Delaware Canal, 1928-1972, by five-year rolling average.

and Chesapeake Bay. The eastern terminus at Reedy Point is approximately 70 km south of Philadelphia and 110 km above the entrance to Delaware Bay at Cape Henlopen-Cape May. The Canal's connection with Chesapeake Bay to the west is generally considered to be at the mouth of the Elk River, approximately 55 km north of Baltimore and 340 km north of the entrance to Chesapeake Bay at Cape Charles, Virginia.

The tides in the C & D Canal are not independent tides but are forced oscillations of periods which are determined by the phasing and amplitudes of the impulses which maintain them--the tidal waves that have ascended the Delaware and Chesapeake Bays from the ocean. The phasing and amplitudes of these two forcing functions are largely determined by the following geographic features. First, the distance from the mouth of Chesapeake Bay to the western end of the Canal is much greater than from the mouth of the Delaware Bay to the eastern end of the Canal. Second, Delaware Bay is funnel shaped whereas Chesapeake Bay is longer, dendritic, and shoaler. As a result, the amplitude of the tidal wave in Chesapeake Bay is reduced from about 85 cm to 67 cm at the western end of the Canal whereas in Delaware Bay the amplitude increases from 128 cm to about 158 cm at Reedy Point. In addition, the highs and lows of the tide derived from the same oceanic tide arrive at Courthouse Point approximately 10 hours (Pritchard and Gardner, 1974) later than at Reedy Point. This results in an interesting complication in the Canal's tidal regimen. Because a given tide at Courthouse Point *approximately* phases with the succeeding tide at Reedy Point, higher highs occur at Courthouse Point at approximately the same time as lower highs at Reedy Point. Similarly, lower highs, lower lows, and higher lows at Courthouse Point correspond approximately to higher highs, higher lows, and lower lows at Reedy Point. In addition to this variable height relationship, there are also variations in the lunitidal intervals, i.e., the time difference between the meridian passages of the moon and the next high or low water.

As a result, flows in the Canal are highly variable over a wide range of time scales. According to Pritchard et al. (1974), instantaneous maximum transports ranged from 2,265 m^3/sec to about 2,830 m^3/sec during March and August of 1971, and April of 1972. Net non-tidal transport, i.e., the transport averaged over a single tidal cycle, commonly exceeded 565 m^3/sec and was just as apt to be easterly as westerly. The long-term net transport, however, was easterly although the magnitude was highly dependent on the averaging period. Maximum surface current velocities may approach 2.6 m/sec (5 knots) in extreme instances. Normal maximum surface velocities are about 1.1 m/sec (2.2 knots), while maximum bottom current velocities are about 0.9 m/sec (1.8 knots).

Rives (1977, in press) has shown that the net non-tidal transports in the Canal can be considered as hydraulically driven. According to Rives, in spite of the complicated characteristics of the tides at the ends of the Canal, the difference in elevation between the ends of the Canal and the non-tidal transport (both averaged over a single tidal cycle) are linearly related. This linear regression as calculated by Rives has a small intercept. That is, at zero elevation difference there is a small *westward* transport or, to put it another way, at zero transport there is a small west to east slope in sea level along the Canal. T. O. Najarian (personal communication) believes this intercept is real and probably related to the higher salinities in Delaware Bay off Reedy Point as compared to the Elk River.

There are also flow variations in the Canal due to meteorological effects. The passage of storms or pressure systems over the region can produce water level changes

and thus currents. Such effects would be included in Rives' (1977) regression of elevation difference on net non-tidal transports.

The salinity distribution in the Canal is determined by the salinity in the Chesapeake and Delaware estuaries and the currents through the Canal. The lower salinities in Chesapeake Bay (Elk River) near the western end of the Canal as compared to those off Reedy Point in Delaware Bay, previously described as being primarily responsible for the small net non-tidal flow from east to west at zero elevation difference across the Canal, are due to the close proximity of the Susquehanna River to the mouth of the Elk River. According to Pritchard and Gardner (1974), the monthly average salinity difference ranges from 0.5°/$_{oo}$ in January to approximately 3.0°/$_{oo}$ in October and November. Within the Canal the salinity distribution is controlled by the action of the currents (which are highly variable) on the salinities at the Canal boundaries. At times the current flows long enough and strong enough to replace the water in the Canal with either Delaware Bay water or Susquehanna River - Elk River water.

DISTRIBUTIONS OF SUSPENDED SEDIMENT, TEMPERATURE AND SALINITY

Introduction

From 11 March 1971 through 28 February 1972 thirteen cruises were made through the Chesapeake and Delaware Canal. Two additional cruises were made since then; one on 14 February 1973, the second on 5 October 1976. On each of these cruises data were taken at 12 - 14 stations located within the Canal and in adjacent areas of the upper Chesapeake Bay and Delaware Bay, Fig. 6. Measurements were made of temperature, electrical conductivity (salinity) and the concentration of suspended sediment (total suspended solids).

The cruises were made as near the time of slack water as possible. Cruises made west to east were *usually* on slack before flood (eastward flowing current), and cruises east to west were *usually* on slack before ebb (westward flowing

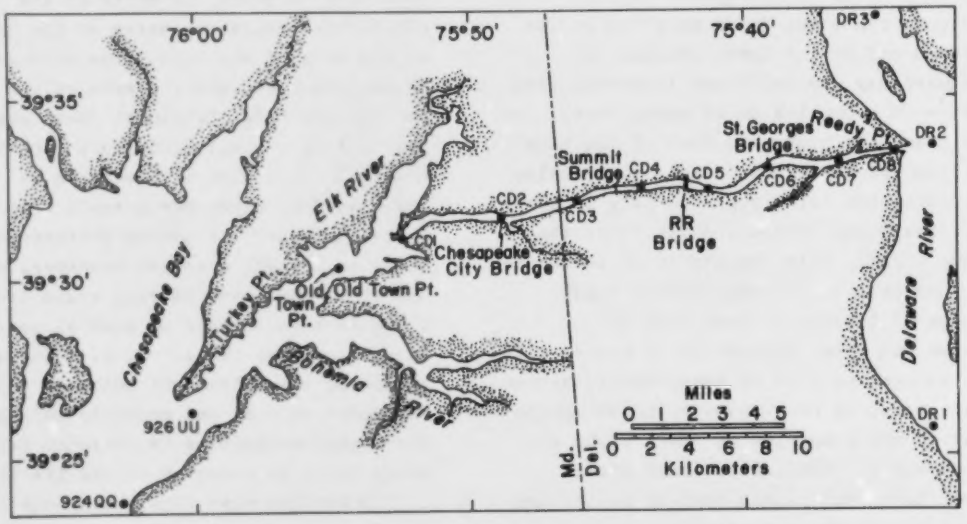

Fig. 6. Chart of Chesapeake and Delaware Canal showing location of temperature, salinity and suspended sediment stations.

current). The dates of the cruises, the directions in which the sections were made and the phase of the tide are summarized in Table 1.

Methods

Suspended Sediment

The concentrations of suspended sediment (total suspended solids) were determined by filtration of measured volumes of water (generally 500 ml) through pre-weighed 0.6 µm average pore diameter Nuclepore® membrane filters. The water samples were collected with a submersible pump and were filtered aboard ship. The filters and their sediment loads were rinsed several times with distilled water to remove any sea salt and were placed in small individual desiccators made from 120 ml (4 ounce) squat form jars (Schubel, 1968). Samples were desiccated over silica gel at ambient temperature for at least 72 hours before weighing. All weighings were made to ± 0.03 mg.

Salinity and Temperature

Salinities were computed from measurements of temperature and electrical

TABLE 1

Cruise Summary: Cruise Number, Date, Direction, and Stage of Tidal Current For Each of the Cruises.

Cruise	Date	Direction of Cruise	Slack Before
1	11 March 1971	W → E	Flood
2	23 March 1971	E → W	Ebb
3	25 March 1971	E → W	Ebb
4	30 March 1971	W → E	Ebb
5	18 August 1971	W → E	Flood
6	27 August 1971	W → E	Flood
7	30 August 1971	W → E	*
8	8 September 1971	W → E	Flood
9	19 October 1971	W → E	Flood
10	16 November 1971	W → E	Flood
11	14 December 1971	W → E	Flood
12	27 January 1972	W → E	Flood
13	28 February 1972	W → E	Flood
14	14 February 1973	W → E	Flood
15*	5 October 1976	W → E	Flood

*Run not made at slack water

conductivity made with a Chesapeake Bay Institute ICTI (induction conductivity temperature indicator). The computed salinities have a precision of about ± 0.03‰ and an accuracy of approximately ± 0.05‰. Temperatures are accurate to within ± 0.02C. For a complete description of the ICTI see Schiemer and Pritchard (1961).

Weather

Weather is reported in the following code:

Code	Description
00	Cloudless (from no clouds up to 1/10 coverage)
01	Partly cloudy (from 1/10 to 5/10)
02	Cloudy (over 5/10 up to 9/10)
03	Overcast (over 9/10)
04	Low fog, on ground or at sea
05	Haze
07	Distant lightning
10	Precipitation within sight
11	Thunder, without precipitation
13	Squally weather
16	Waterspout seen
19	Signs of tropical storm
40	Fog
49	Fog in patches
51	Intermittent drizzle
52	Continuous drizzle
57	Drizzle and fog
58	Drizzle and rain, mixed
61	Intermittent rain
62	Continuous rain
67	Rain and fog
69	Rain and snow, mixed
71	Intermittent snow (in flakes)
72	Continuous snow (in flakes)
77	Snow and fog
78	Frozen drizzle (grains of snow)
79	Ice crystals or frozen rain drops
81	Rain showers
83	Snow showers
88	Hail, or rain and hail showers
93	Thunderstorm, with rain (or snow) but without hail
94	Thunderstorm, with hail
97	Heavy thunderstorm

Wind direction is given in degrees true.

Wind speed is given in knots.

Time

All times are Eastern Standard Time.

The Observations

Suspended Sediment

The suspended sediment observations are summarized as longitudinal sections along the axis of the Canal in Figs. 7-21.

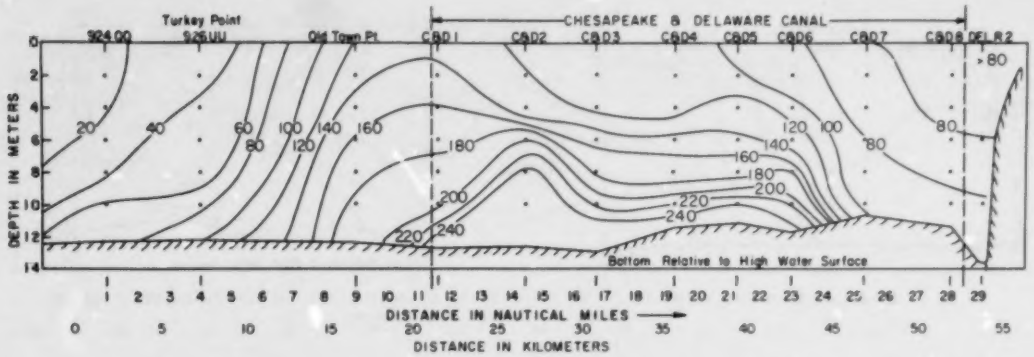

Fig. 7. Distribution of suspended sediment (mg/ℓ) on 11 March 1971.

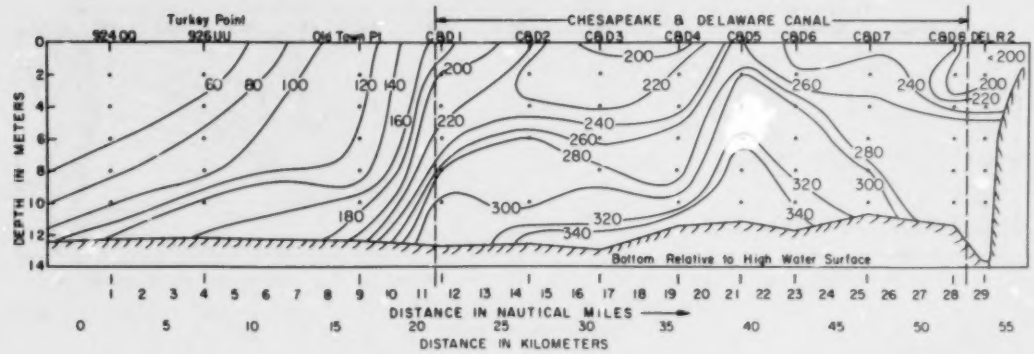

Fig. 8. Distribution of suspended sediment (mg/ℓ) on 23 March 1971.

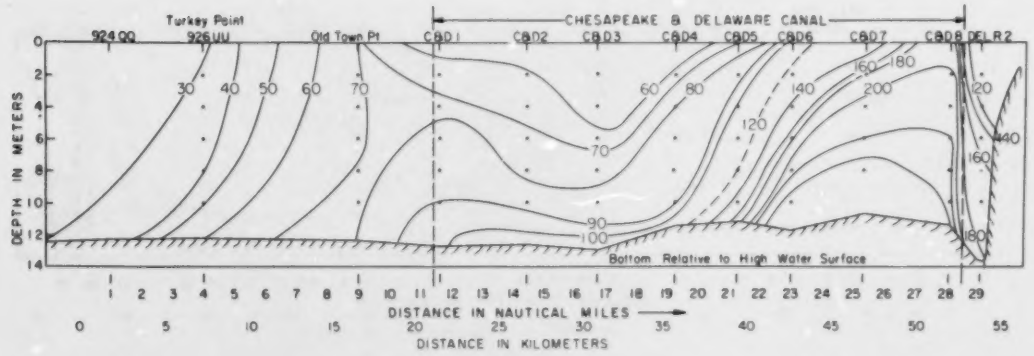

Fig. 9. Distribution of suspended sediment (mg/ℓ) on 25 March 1971.

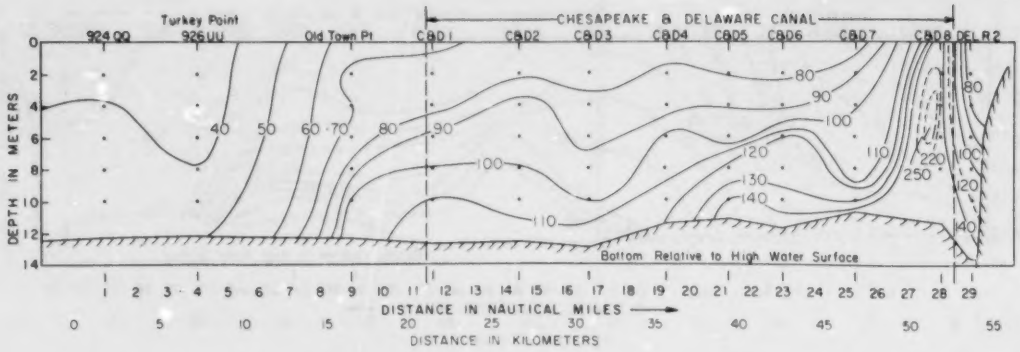

Fig. 10. Distribution of suspended sediment (mg/ℓ) on 30 March 1971.

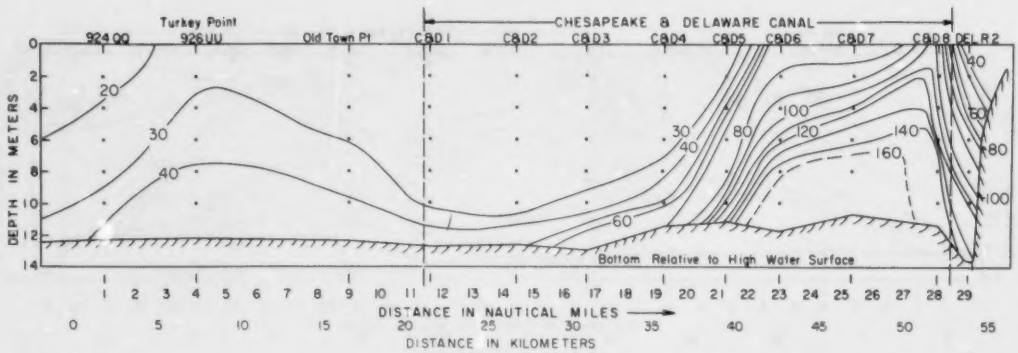

Fig. 11. Distribution of suspended sediment (mg/ℓ) on 18 August 1971.

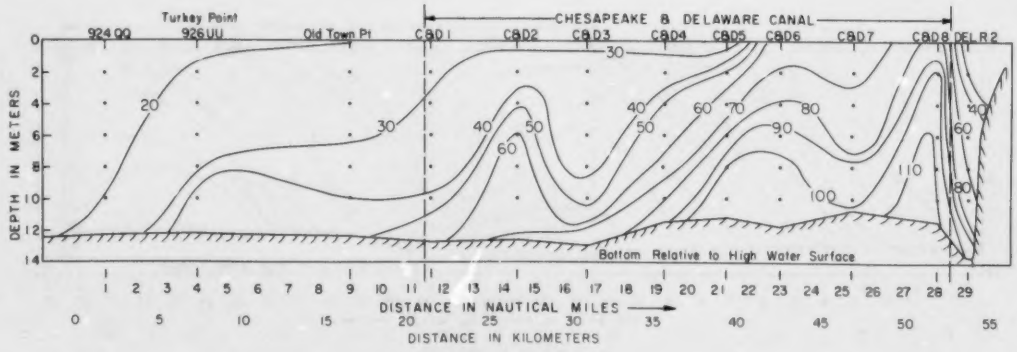

Fig. 12. Distribution of suspended sediment (mg/ℓ) on 27 August 1971.

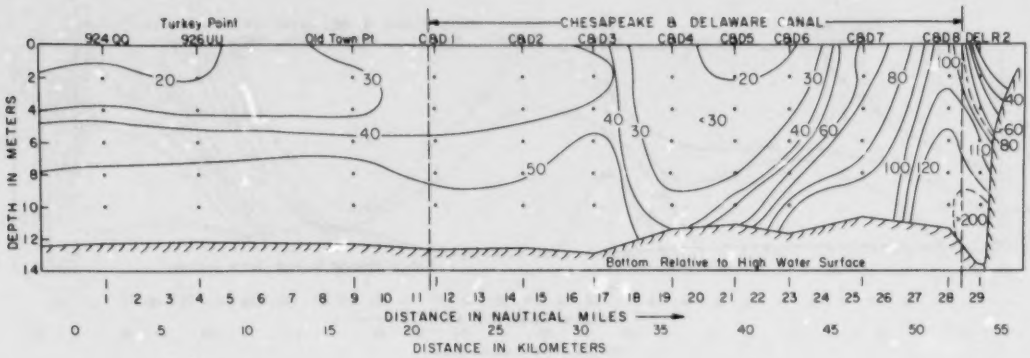

Fig. 13. Distribution of suspended sediment (mg/ℓ) on 30 August 1971.

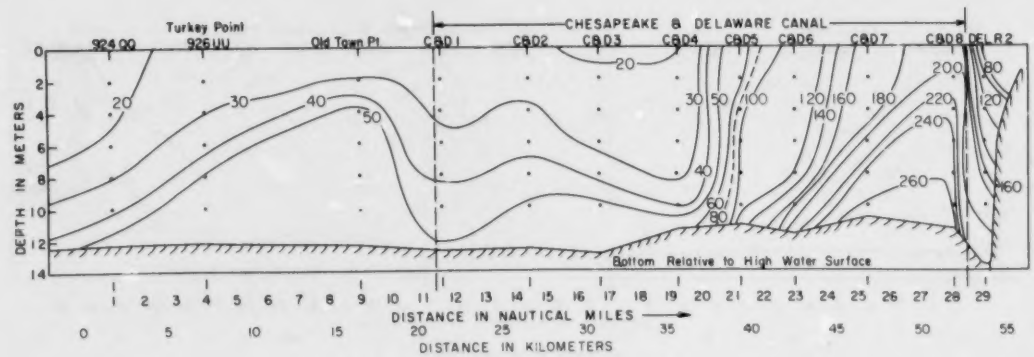

Fig. 14. Distribution of suspended sediment (mg/ℓ) on 8 September 1971.

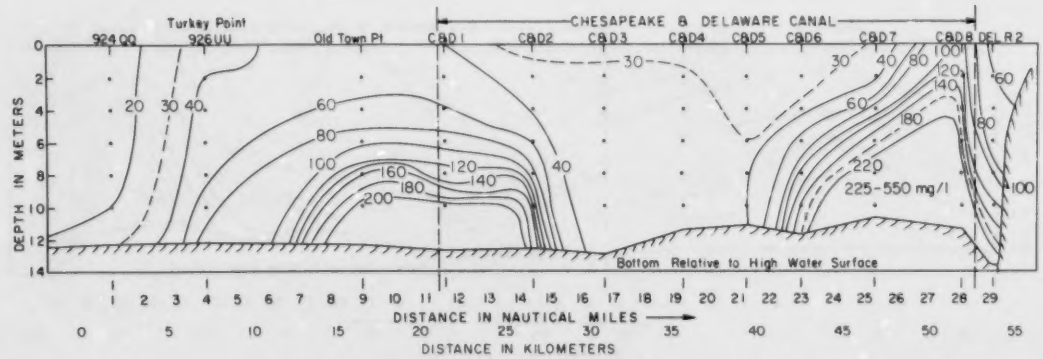

Fig. 15. Distribution of suspended sediment (mg/ℓ) on 19 October 1971.

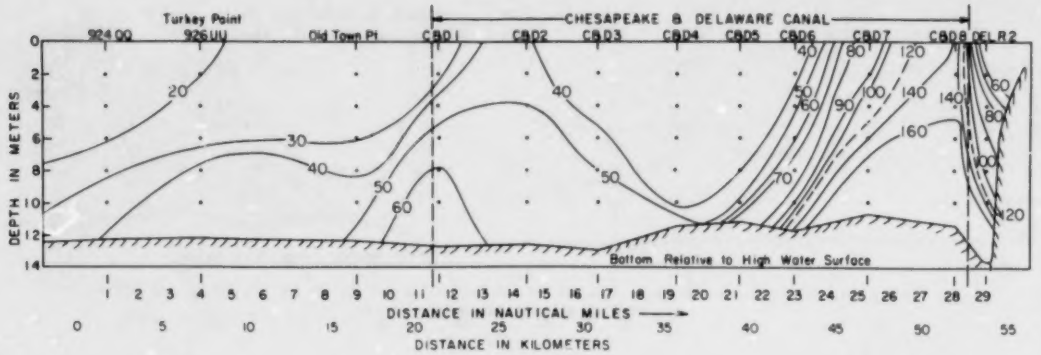

Fig. 16. Distribution of suspended sediment (mg/ℓ) on 16 November 1971.

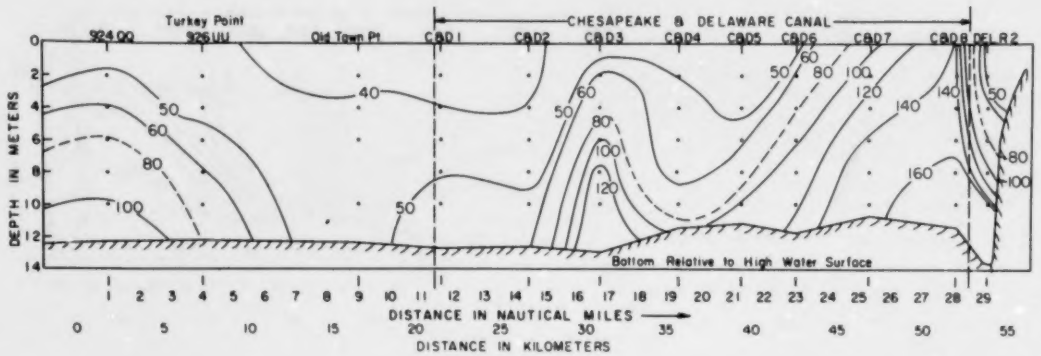

Fig. 17. Distribution of suspended sediment (mg/ℓ) on 14 December 1971.

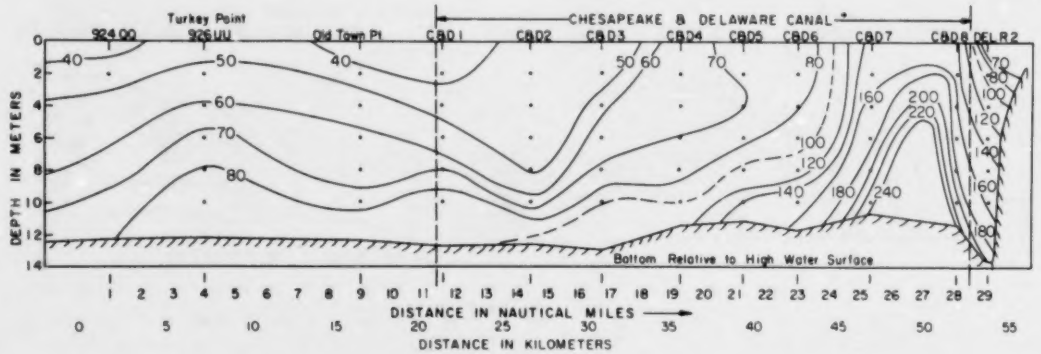

Fig. 18. Distribution of suspended sediment (mg/ℓ) on 27 January 1972.

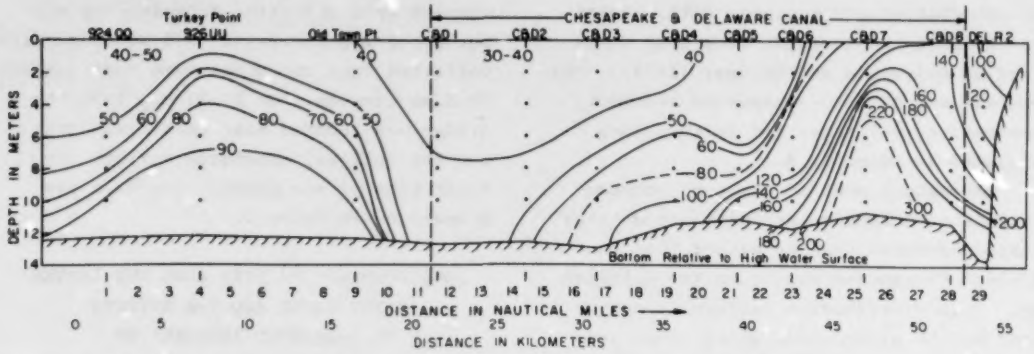

Fig. 19. Distribution of suspended sediment (mg/ℓ) on 28 February 1972.

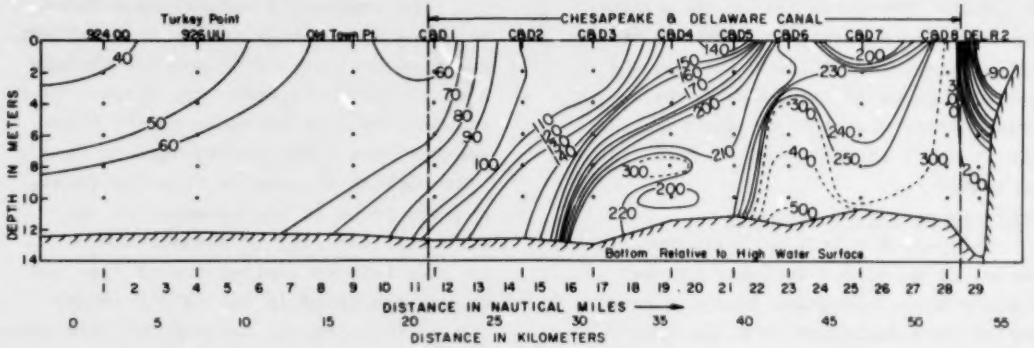

Fig. 20. Distribution of suspended sediment (mg/ℓ) on 14 February 1973.

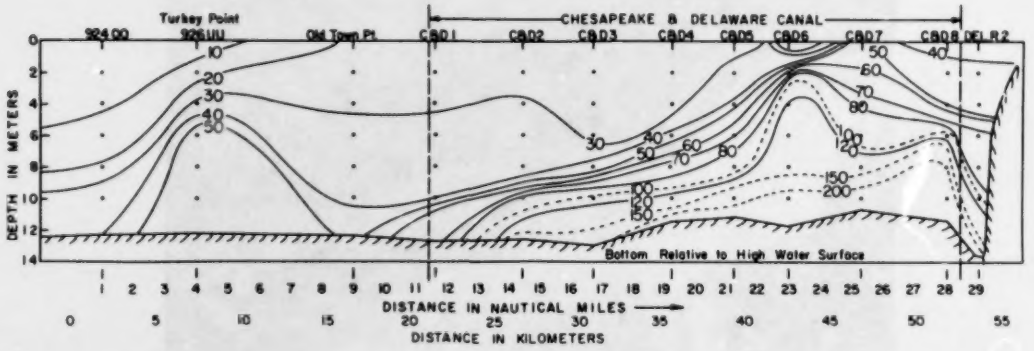

Fig. 21. Distribution of suspended sediment (mg/ℓ) on 5 October 1976. The bottom topography indicated in the figure has not been corrected for removal of the "plug" in the eastern end of the Canal which was completed in March 19[illegible].

The temperature and salinity data, except for the last two cruises, have been summarized by Pritchard and Gardner (1974). Our complete set of data--suspended sediment, temperature, salinity, and weather--are tabulated in Appendix A.

Throughout most of the year, concentrations of suspended sediment are greater within the Canal than in either the adjacent Chesapeake Bay or in the Delaware Bay. This distribution pattern is determined by the circulation within the Canal (in preparation). The sediment suspended within the Canal is derived primarily from the contiguous bays, with lesser amounts from resuspension of bottom sediments in the Canal. The strengths of the sources have not been determined. The net transport of suspended sediment through the Canal can probably not be determined unequivocally with the present data, but this is being investigated further (in preparation).

Observations During Dredging

On 20-21 May 1971 we collected a few samples of suspended sediment in the vicinity of an operating dredge. Water samples were collected from the spillway (Fig. 22), in the discharge plume and in nearby areas of the Canal. Spillway samples were collected from the top and bottom of the spillway. All water samples collected from the plume were near-surface (0.5 m) samples. On 20-21 May 1971 the dredge was located near Chesapeake City, and the spillway discharge entered the north side of the Canal. The data are summarized in Table 2.

SOME COMMENTS ON FISH EGGS AND LARVAE IN THE CANAL AND THE EFFECTS OF SUSPENDED SEDIMENT ON THEIR SURVIVAL AND DEVELOPMENT

Fish Eggs and Larvae

The Chesapeake and Delaware Canal long has been recognized as an important spawning and nursery ground for striped bass in the Chesapeake Bay region. Eggs and/or larvae of at least twenty other species have also been identified in ichthyoplankton samples from the Canal, and are found in the waterway in all months of the year (Johnson and Koo, 1973). Peak concentrations of eggs and larvae are found in spring and summer. The most important component of this population, numerically and economically, is striped bass (Johnson, 1973). The Canal

Fig. 22. Spillway, showing discharge entering north side of the Canal.

TABLE 2

Summary of Suspended Sediment Observations
During Dredging on 20-21 May 1971

Station	Date	Time	Depth (m)	Suspended Sediment (mg/ℓ)
Bethel	20 May 1971	0900	0	39.1
			5	64.2
			11.5	181.7
Road End	20 May 1971	0940	0	83.7
			3	82.8
			6	87.8
			9	107.4
			12	120.8
Chesapeake City	20 May 1971	1020	0	67.5
			3	81.4
			6	90.0
			9	84.2
			12	88.9
Discharge Plume	20 May 1971	1100	0.5	61.5
		1110	0.5	53.2
Spillway, Top	21 May 1971	1200	0.1	69.9
		1230	0.1	70.2
		1300	0.1	68.0
		1330	0.1	65.0
		1400	0.1	61.1
Spillway, Bottom	21 May 1971	1200	0.1	99.0
		1330	0.1	70.8
		1400	0.1	59.4
Discharge Plume	21 May 1971	1430	0.5	63.3
		1440	0.5	132.7

is important as a source of striped bass for the entire Atlantic coast fishery, and as a migratory shortcut between Chesapeake Bay and northeastern Atlantic waters.

The C & D Canal is a turbulent and turbid environment. Maximum tidal currents average more than 100 cm/sec (2 knots) and the mean current velocity is about 70 cm/sec. Concentrations of suspended sediment frequently exceed background levels in the adjacent upper Chesapeake Bay (Schubel, 1968; 1969; Schubel et al., 1968; Schubel and Biggs, 1969), but fall within the range of concentrations typical of other estuaries (Schubel, 1975). Concentrations of total suspended sediment within the Canal, particularly near the bottom, however, frequently exceed levels reported to have significant effects on various life stages of finfish and invertebrates.

Less is known about the effects of suspended sediment on fish eggs and larvae than on adult forms, and even the results for adults are frequently equivocal. The variety of laboratory techniques used to keep sediments in suspension, the different kinds of suspended solids used, and the range of organisms and life stages tested often make comparisons of results awkward, and conclusions tenuous.

It is generally recognized that effects of suspended sediments on organisms depend greatly on the character of the sediments, the nature and level of associated contaminants, organism life-stage, and the intensities of other stresses, such as temperature, salinity, and starvation, to which the organisms are concurrently subjected (Sherk, 1972; Cairns, 1968; Morgan, Rasin and Noe, 1975). Lack of research on effects of suspended sediments on organisms which has incorporated more than a few of these factors makes it difficult to predict such effects in natural environments.

Striped Bass Spawning, Eggs, and Larvae in the C & D Canal

Striped bass (*Morone saxatilis*) is anadromous, spawning in fresh or brackish water (Bigelow and Schroeder, 1953). Spawning in Chesapeake Bay occurs mainly in April and May (Hildebrand and Schroeder, 1928; Raney et al., 1952). Water temperature is the principal factor controlling time of spawning, with minimum temperature approximately 14.4C and optimum temperature about 18.3C (Raney et al., 1952; Albrecht, 1964). The highest concentrations of striped bass eggs, up to $36/m^3$ (Johnson and Koo, 1973), in the Chesapeake Bay region have been observed in the western half of the C & D Canal, near Chesapeake City. Johnson (1973) collected over 60,000 striped bass eggs from 15 April to 13 June, 1971, in this area, with about 77% of the total catch collected in the last week of April and the first week of May.

Eggs are cast at the water surface and are semibuoyant (Johnson and Koo, 1973; Schubel et al., 1974a, b). Position of eggs in the water column depends on their effective settling velocities. In still water striped bass eggs sink rapidly to the bottom where hatching success ranges from near zero on mud to less than 60% on gravel (Bayliss, 1968). According to Albrecht (1964), currents of at least 30 cm/sec are required to keep eggs afloat, with faster currents reportedly maintaining at least a fraction of the eggs at or near the surface. Average current speed in the Canal is about 70 cm/sec and Johnson (1973) collected about 39% of his total catch of striped bass eggs in near-surface net hauls.

Hatching time is temperature dependent, and varies from 30 hours at 22C to 48 hours at 18C to about 72 hours at 14-16C (Raney et al., 1952; Bigelow and

Schroeder, 1953; Johnson and Koo, 1973). Morgan and Rasin (1973) found peak hatching (% per day) to occur at 19 - 22C, and temperatures between 16 and 23C to be optimal for larval survival.

Low salinities are required for hatching success and larval survival. Albrecht (1964) found chlorinities between 0.948 and 4.740‰ to be optimal. Our observations contained elsewhere in this report and those of others (Pritchard and Gardner, 1974; Johnson and Koo, 1973; and Morgan and Rasin, 1973) clearly show that salinity[1] conditions over the entire length of the Canal are favorable for spawning and hatching success, and larval survival suggested by Albrecht (1964).

Striped bass larvae are approximately 2.5 mm long at hatching, and 3.2 mm at 60 hours (Raney et al., 1952). At this stage larvae sink to the bottom in quiet water, even though they possess some swimming ability. At 84 hours they are 4.4 mm in length, at 120 hours 5.2 mm, at 144 hours 5.8 mm, and are 6 mm long at 192 hours (Pearson, 1938, as cited by Raney et al., 1952). Mansuetti (1958) stated that the primary cause of larval mortality was starvation, and Raney et al. (1952) set the onset of larval vulnerability to this stress at about 6 mm. The post larval stage is attained at about 10 days after fertilization when larvae reach a length of about 9 mm.

The time required for water to move from Chesapeake City during 22 - 25 April, 1971, to Delaware Bay ranged from 163 hours to 229 hours (6.8 - 9.5 days) (Chesapeake Biological Laboratory et al., 1973). Assuming a hatching time of three days, striped bass eggs spawned near Chesapeake City would probably still be in the western half of the Canal at hatching, and before being swept out of the Canal the larvae would be strong enough swimmers to maintain their positions. The largest concentrations of striped bass larvae in the Canal are found in the western half (Johnson and Koo, 1973).

White Perch Spawning, Eggs, and Larvae in the C & D Canal

White perch (*Morone americana*) eggs accounted for about 11% of the total fish eggs collected by Johnson (1973) in 1971 and, together with striped bass eggs, accounted for over 90% of the total eggs collected in that survey in the Canal area. White perch is semi-anadromous, and the spawning season is approximately the same as that for striped bass. Johnson (1973) collected about half the total white perch eggs in the last week of April and the first week of May, 1971.

White perch eggs are laid in masses, are adhesive and demersal (Bigelow and Schroeder, 1953). Hatching time is 44 - 50 hours at about 18C (Morgan, Rasin and Noe, 1973) and 144 hours (6 days) at 11C (Bigelow and Schroeder, 1953). Morgan and Rasin (1973) found that a salinity range of 0 - 10‰ had no effect on the hatching success or development rate of white perch eggs. Optimum egg development occurs between 11 and 16C (Morgan and Rasin, 1973).

Johnson (1973) took most white perch eggs and larvae in the Canal and Elk River, and about 88% of the total catch in each was taken by bottom net hauls. Approximately half of the total white perch larvae catch was obtained in the last week of May and the first week of June, 1971. Length after hatching is 2.3 mm (Bigelow and Schroeder, 1953).

Effects of Suspended Sediment Concentrations Characteristic of the Canal on Fish Eggs and Larvae

The spatial and temporal distributions of suspended sediment in the Canal are described in detail elsewhere in this report. Unfortunately, only a very few observations were made in the months of April, May, June, and July which include the period of spawning and larval

development for striped bass and white perch. Maximum concentrations are expected during the period of peak discharge of the Susquehanna which occurs most frequently in March. Our data for March consequently provide a good estimate of the maximum concentrations to which eggs and larvae of striped bass and white perch would be subjected in a normal year.

Our 1971 data for the section of the Canal from the Old Town Point Station through Station C & D 4, which includes the area of maximum concentrations of fish eggs and larvae, show that suspended sediment levels from surface to bottom were almost always greater in March than during any other month. In the seven other months in which sampling occurred, which did not include April or May, secondary peaks usually occurred in February. The averaged data from four sampling cruises in March of 1971 are presented in Table 3. The maximum and minimum suspended sediment concentrations observed for these five stations are given in Table 4. The maximum and minimum levels were observed most frequently on two cruises, 23 March and 25 March, 1971, respectively. Readings were occasionally taken at depths up to 12.0 m at these stations. The maximum observed suspended sediment concentration at any of these stations was 422.5 mg/ℓ measured at a depth of 12.0 m at Station C & D 4 on 23 March 1971.

Review of Literature on Effects of Suspended Sediment on Fish Eggs and Larvae

Although eggs and/or larvae of many species other than striped bass and white perch are found in the C & D Canal, these two species dominate the pre-juvenile population of the waterway, and are present in the Canal during that period of the year when suspended sediment concentrations normally are highest. For these reasons, we have focused our attention on research

TABLE 3

Average Suspended Sediment Concentrations (mg/ℓ) Observed in March 1971 (data from 4 cruises).

Depth (m)	Station: Old Town Point	C & D 1	C & D 2	C & D 3	C & D 4
0	95.49	107.23	117.28	106.01	111.56
2	91.83	124.98	100.02	110.04	125.06
4	101.86	134.69	130.60	118.12	126.95
6	102.45	147.04	162.21	139.01	148.44
8	113.98	162.82	149.38	158.77	148.77
10	133.08	173.50	181.78	129.33	183.53
12	----	----	260.76	----	268.06
<D>	11.8 m	12.0 m	12.3 m	10.7 m	12.7 m

TABLE 4

Minimum and (Maximum) Suspended Sediment Concentrations (mg/ℓ) Observed in 1971.

Depth (m)	Old Town Point	Station C & D 1	C & D 2	C & D 3	C & D 4
0	64.94 (127.27)	56.58 (168.67)	54.83 (219.85)	46.20 (1 0.13)	57.83 (193.90)
2	64.62 (121.40)	69.46 (205.11)	67.61 (202.40)	56.62 (213.16)	67.14 (229.17)
4	63.14 (153.85)	72.23 (226.82)	61.24 (236.24)	53.87 (217.29)	79.63 (225.00)
6	63.99 (160.09)	86.07 (238.68)	72.95 (279.82)	60.79 (254.94)	80.03 (266.69)
8	74.47 (173.38)	83.35 (273.70)	74.47 (273.51)	82.96 281.84)	87.54 (225.78)
10	77.28 (185.65)	90.15 (302.90)	84.23 (288.75)	78.53 (211.20)	86.96 (305.13)

on these species. The eggs of these species are also of two different and important types with respect to potential effects of sediments. Striped bass eggs, being semi-buoyant, are found throughout the water column, but usually are concentrated below mid-depth in the Canal, where suspended sediment concentrations are usually highest. The demersal eggs of white perch are subject not only to these higher levels of seston, but also possibly to smothering by deposition of sediments.

Effects of suspended sediment on fish eggs and larvae are classed below in three categories: effects on rate of egg development, hatching success, and larval survival. No discussion of the mechanisms that lead to these effects is attempted here, other than to itemize the most probable means: mechanical (abrasive) action, smothering, reduction of light, sorption properties, or any combination of these factors, by or of the suspended sediment. It is also possible that suspended material may act in other ways, e.g., by interfering with larval feeding (Cairns, 1968), and through synergistic effects of suspended sediments in combination with other physical, chemical and biological stresses (Sherk, 1972).

Effects of Suspended Sediments on Hatching Success of Fish Eggs

Morgan, Rasin and Noe (1973, 1975) tested the effects of different concentrations of suspended sediment on striped bass and white perch eggs, using apparatus designed by Schubel et al. (1972). All sediments tested came from the western end of the Canal and were mainly silt and clay.

Morgan et al. exposed white perch eggs to suspended sediment levels from 50 - 5,250 mg/ℓ, and striped bass eggs to levels between 20 and 2,300 mg/ℓ. They found that hatching success of white perch eggs was unaffected over the range of

concentrations tested; hatching success of striped bass eggs was similarly unaffected by suspended sediment levels throughout the range tested. Morgan et al. did not observe adhesion of sediment to eggs of either species except at concentrations above 1,000 mg/ℓ.

These investigators pointed out, however, that the effect of sediment deposition on white perch eggs is probably of greater importance than that of suspended sediments (Morgan et al., 1975). Covering of white perch eggs by a sediment layer greater than 2 mm (or about 1.1 mm above the top of the egg) resulted in total mortality. Thicknesses from 0.5-1.0 mm (about half to all of the egg buried) resulted in mortalities greater than 50%. Morgan et al. concluded that a deposited sediment layer of less than half (about 0.45 mm) the diameter of the egg did not significantly affect the hatching success of white perch eggs.

Auld and Schubel (1974) tested the effects of continuous exposure to natural fine-grained suspended sediments on six anadromous species: striped bass, white perch, yellow perch (*Perca flavescens*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), and alewife (*Alosa pseudoharengus*). The eggs and/or larvae of all these species have been found in the C & D Canal (Johnson, 1973). The apparatus used to maintain suspensions was that described by Schubel et al. (1972). Concentrations of suspended sediment tested were 25, 50, 100, 500 and 1,000 mg/ℓ (in excess of control concentration which were <10 mg/ℓ). Sediments were collected from the main body of the Chesapeake Bay and fractionated by settling to remove particles with settling velocities greater than about 5×10^{-3} cm/sec; only the finer fractions were used in their experiments.

None of these concentrations significantly ($p \leq 0.05$) affected hatching success of yellow perch, blueback herring or shad eggs, but a suspended sediment concentration of 1,000 mg/ℓ did significantly reduce the hatching success of striped bass and white perch eggs. Test results on alewife eggs were inconclusive (Auld and Schubel, 1974).

The results of the above experiments support earlier work by Schubel et al. (1973), using the same laboratory apparatus and sediment types, on the effects of suspensions up to 1,000 mg/ℓ on the hatching success of striped bass and yellow perch eggs. These experiments showed that only concentrations of 1,000 mg/ℓ had a significant effect on the hatch of yellow perch and striped bass eggs (at the 90% and 99.9% confidence levels, respectively).

These results are also consistent with those reported by Schubel and Wang (1973) working with natural fine-grained sediments in excess concentrations of 25, 50, 100, and 500 mg/ℓ. Schubel and Wang reported no significant (95% confidence level) effect on hatching success of white perch, striped bass, or yellow perch eggs from suspended sediment levels in the tested range.

A conservative estimate of a maximum limit to which striped bass and white perch eggs might safely be subjected over the entire incubation period, based on the above findings, would seem to be about 500 mg/ℓ, regardless of any delays in hatching caused by low temperatures or high levels of suspended material. Based on our sampling in the C & D Canal, as previously summarized, prolonged exposures to seston levels in excess of 300 mg/ℓ in the western half of the Canal rarely occurs, even in the discharge of an active dredge. All available evidence indicates that these eggs can tolerate extremely high (perhaps >1,000 mg/ℓ) seston levels for periods of many hours. It is unlikely that, even close to an operating dredge, suspended sediment concentrations would be maintained at that level for a significant length of time.

Effects of Suspended Sediments on Rates of Fish Egg Development

Morgan et al. (1973; 1975) found that while suspended sediment concentrations from 50-5,250 mg/ℓ and from 20-2,300 mg/ℓ did not significantly affect the hatching success of white perch and striped bass eggs, respectively, concentrations in excess of 1500 mg/ℓ significantly ($p = 0.05$) slowed the rate of egg development for both species.

Morgan et al. found that the development rate of white perch eggs exposed to 5,250 mg/ℓ suspended solids was about 65% of control eggs; lesser concentrations had a smaller influence, with suspensions of 2,000-3,250 mg/ℓ reducing egg development rate to 80-85% of controls. The maximum delay in hatching of white perch eggs caused by the upper seston levels was one day. Striped bass eggs appear more vulnerable to this particular effect, and Morgan et al. reported that suspended sediment levels from 1,500 - 2,300 mg/ℓ reduced the development rate of eggs to about 80% of that of the controls. If the normal hatching period for striped bass eggs is three days, this reduction would represent an extension of incubation by about 18 hours.

Schubel and Wang (1973) also reported that concentrations of suspended sediment which did not significantly affect hatching success for several species of eggs did retard hatching by up to half a day. These results are summarized in Table 5. The concentrations of suspended sediments used by Schubel and Wang were 25, 50, 100 and 500 mg/ℓ. Neither Schubel and Wang (1973) nor Morgan et al. (1973; 1975) observed any abnormal development of experimental eggs.

There is no evidence to indicate that a short delay in hatching of fish eggs is, by itself, an undesirable effect of suspended sediments. A delay in hatch of striped bass eggs of one day is well within observed variation in incubation period observed in the field (Raney et al., 1952). Nor does it appear that, in the C & D Canal, a delay in hatching of one day would significantly increase the probability that striped bass eggs would be transported into the eastern end of the Canal or into Delaware Bay, where environmental conditions are not as favorable for larval survival.

TABLE 5

Delay in Hatching of Eggs Incubated in Suspensions of Natural Fine-Grained Sediments (after Schubel and Wang, 1973)

Species	Concentration of Suspended Sediment	Delay in Hatching Relative to Controls
Yellow perch	100 mg/ℓ	6-12 hr
Yellow perch	500 mg/ℓ	6-12 hr
White perch	100 mg/ℓ	4-6 hr
White perch	500 mg/ℓ	4-6 hr
Striped bass	100 mg/ℓ	4-6 hr
Striped bass	500 mg/ℓ	4-6 hr

Effects of Suspended Sediments on Fish Larvae

Morgan et al. (1973; 1975) conducted a series of experiments, using an apparatus designed by Schubel et al. (1972), to test the effects of different levels of suspended sediment on white perch and striped bass larvae. Greatest length of exposure was two days. The results of these experiments are summarized in Table 6.

Morgan et al. (1973; 1975) also ran some experiments using a six hour exposure period. Neither white perch nor striped bass larvae sujected to suspended sediment concentrations up to 5200 mg/ℓ for six hours suffered significant mortalities. Morgan et al. pointed out that longer exposures to lower concentrations might be lethal. No examination for sublethal effects was conducted. Allowing for this lack of information, Morgan et al. concluded that there was no indication that suspended material concentrations in the C & D Canal, including those resulting from dredging, posed a threat to the survival of larvae of these species.

Auld and Schubel (1974) using the laboratory apparatus described by Schubel et al. (1972) assessed the effects of continuous exposure to excess concentrations of suspended sediment of 50, 100, 500 and 1,000 mg/ℓ on mortality of larvae of American shad, striped bass and yellow perch, using fine-grained Chesapeake Bay bottom sediments. The results of this work are summarized in Table 7. Auld and Schubel (1974) concluded that suspensions of fine-grained material at or above a concentration of 500 mg/ℓ had a significant effect on the survival of striped bass larvae exposed for two days or more, and on American shad and yellow perch larvae exposed for four days. American shad larvae appear to be less tolerant to suspended sediment and suffered significantly higher mortalities than control larvae when subjected continuously to

TABLE 6

Effects of Suspended Sediment on Mortality of Fish Larvae (after Morgan et al., 1973, 1975)

White Perch Larvae

Suspended Sediment Range (mg/ℓ)	Mortality (percent)	Exposure (days)	LD_{50} (calculated) Concentration (mg/ℓ)
1626-5380	14.6-19.3	1	66,989 (1 day)
1626-5380	23.3-49.3	2	6,903 (2 days)

Striped Bass Larvae

Suspended Sediment Range (mg/ℓ)	Mortality (percent)	Exposure (days)	LD_{50} (calculated) Concentration (mg/ℓ)
1557-5210	19.9-31.3	1	20,417 (1 day)
1557-5210	24.7-56.7	2	6,292 (2 days)

TABLE 7

Effects of Suspended Sediments on Mortality
of Fish Larvae (after Auld and Schubel, 1974)

Species	Age at Start of Experiment	Exposure (days)	Suspended Sediment Levels having Significant* Effect on Larval Survival
American shad	4 - 12 hr	4	100†, 500, 1,000 mg/ℓ
Striped bass	4 - 8 hr	2, 3	500, 1,000 mg/ℓ
Yellow perch	24 hr	4	500, 1,000 mg/ℓ

* $p \leq 0.005$
† $p < 0.025$

concentrations as low as 100 mg/ℓ for four days. Based on these results of the species tested, only American shad larvae would appear likely to be affected by dredging or disposal operations, if within about one hundred meters of the activity. Shad eggs and larvae, however, are insignificant components of the pre-juvenile population in the Chesapeake and Delaware Canal (Johnson and Koo, 1973).

Wakeman et al. (1975) studied the effects of high suspended sediment levels, generated by open water hopper dredge disposal, on eighteen species of finfish and invertebrates. Of the finfish tested, juvenile striped bass and shiner perch (*Cymatogaster aggregata*) were considered the most sensitive to high seston levels. Wakeman et al. subjected these juveniles to suspensions of fine-grained bentonite, ranging from 600 to 6,000 mg/ℓ, for ten days. Their results are summarized in Table 8. Wakeman et al. (1975) concluded that . . . "the survival of both striped bass and shiner perch showed a strong direct correlation with dissolved oxygen, slight direct correlation with temperature and a very strong inverse correlation with suspended solids concentration."

Wakeman et al. (1975) recorded the suspended solids levels at different heights above the bottom, after hopper disposal of dredged spoils. They noted that even at 0.5 m above the disposal area bottom, suspended sediment concentrations of greater than approximately 2,000 mg/ℓ persisted no longer than about 25 minutes after dumping. Wakeman et al. concluded that such dumping and the resultant turbidity, even near the bottom, normally does not adversely affect even relatively sensitive finfish, but that significant mortalities might result from these activities if: (1) a persistent turbidity current was created at the bottom, and (2) the dumped material contained a large fraction of organic material, thus reducing oxygen content of bottom waters, especially in summer months.

Griffin's (1938) tests of the effects of high levels of suspended natural material on juvenile trout and salmon

TABLE 8

Effects of Suspended Sediment on Mortality of Fish Larvae (after Wakeman et al., 1975)

Species	Temp. C	Dissolved O_2 (ml/l)	(gm/l) (for 10 days) LC_{50}	LC_{20}	LC_{10}
Striped bass	18	5	>2	>2	>2
	18	2	4.6	2.0	1.2
Shiner perch	18	5	>2	1.8	0.5
	18	2	0.9	<0.6	<0.6

provide qualitative support for the conclusions reached above that pre-adult fishes are generally tolerant to high levels of suspended sediment. Griffin exposed fingerling trout for three weeks to suspended sediment levels that fluctuated daily from 3,500 to 360 mg/ℓ, but which usually averaged 500 mg/ℓ for 18 continuous hours each day. Fifty-six percent of the trout survived the entire test period, a much larger fraction than of those held in control tanks, due to unforeseen adverse conditions in the latter. No apparent differences were observed between surviving control and experimental fish. A similar experiment ran for four weeks with juvenile chinook salmon; suspended solids levels fluctuated daily, from 6,500 to 300 mg/ℓ, averaging about 700 mg/ℓ for 18 continuous hours each day. At the end of the four week period, 88% of the experimental fish and 36% of the controls survived. Griffin (1938) could not find a significant difference in mortality between the control and experimental fish after the first three days of the experiment.

Other indirect evidence supporting a conclusion of high tolerance of fish larvae and juveniles to relatively high and fluctuating concentrations of suspended sediment comes from the work of Davis (1960) and Davis and Hidu (1969) who worked with the larvae of three species of bivalve mollusks--hard clam (*Mercenaria mercenaria*), American oyster (*Crassostrea virginica*), and European oyster (*Ostrea edulis*). Davis (1960) tested the effects of varying concentrations of kaolin, Fuller's earth, chalk, and silt upon hard clams exposed for 2 and 12 days. Davis found a concentration of 4,000 mg/ℓ of silt resulted in total mortality of clam larvae if continuously exposed for two days. Although significant mortalities also occurred in silt suspensions of 2,000 mg/ℓ, surviving larvae developed normally if returned to control sea water. Davis concluded that the maximum upper limit for hard clam larval survival in silt suspensions, for which no significant mortalities would occur (for at least 12 days) was 750 mg/ℓ. Davis and Hidu (1969) found no significant mortalities of European oyster larvae exposed to silt suspensions of 4,000 mg/ℓ for seven days. American oyster larvae were found to be more sensitive, suffering significant mortalities in concentrations of 750 mg/ℓ after 12 days exposure. In both

experiments (Davis, 1960; Davis and Hidu, 1969) it was noted that larval tolerance to suspended material varied greatly depending on which of the above solids was tested, and that the ranked toxicity of these solids was different for each species.

Considering the lack of precise data on the effects of suspended sediments on fish larvae, it is impossible to set a "safe" upper limit for concentrations of suspended sediment for striped bass or other larvae in the C & D Canal. Based on the data presented above, and on the conclusions of those authors, it appears that the normal range of background levels of suspended sediment in the Canal, and perturbations caused by dredging and disposal are probably not harmful to these larvae. Striped bass larvae and juveniles remain in the Canal for a variable and undetermined amount of time and are able to avoid disturbed areas such as those being dredged. As larvae grow older and more tolerant of suspended material during late spring and early summer, suspended sediment concentrations in the Canal are usually decreasing.

Summary

The Chesapeake and Delaware Canal is one of the most important spawning and nursery areas for striped bass on the Atlantic coast. The Canal fits well the general outline of a low salinity nursery for many species as an environment in which there are warmer water temperatures than in the bays or coastal areas, an abundance of food, fewer predators, and a reduction in competition because of the low-diversity community (Chesapeake Biological Laboratory et al., 1973).

The normal salinity, water velocity and suspended sediment conditions of the Canal region appear to be ideal for the eggs and larvae of striped bass and perhaps other estuarine species. Many investigators (e.g., Mansueti, 1961; Talbot, 1966) have pointed out that striped bass is especially well adapted to turbulent and turbid environments.

The normal range of concentration of suspended sediments in the Canal does not appear to have a significant effect upon hatching success or larval survival of the species discussed above; nor has it been demonstrated that local, short-term increases in suspended sediment that might result from dredging have such effect (Morgan et al., 1973; Auld and Schubel, 1974; Schubel et al., 1973).

Material dredged from within the Canal is disposed of by pumping the material onto fastlands bordering the Canal. We observed in 1970-1971 that the concentrations of suspended sediment in the spillway effluent were not significantly higher, and were sometimes lower, than ambient concentrations outside of the dredging area. Open water disposal occurs only outside of the Canal proper.

---

[1]Chlorinity can be converted to salinity by the following relationship, $S = 1.8065\ Cl$.

LITERATURE CITED

Albrecht, A. B. 1964. Some observations on factors associated with survival of striped bass eggs and larvae. Calif. Fish and Game 50(2):100-113.

Auld, A. H. and J. R. Schubel. 1974. Effects of suspended sediment on fish eggs and larvae. Chesapeake Bay Institute Special Report 40, Ref. 74-12. 61 pp.

Bayliss, J. D. 1968. Striped bass hatching and hydridization experiments. Ann. Conf., S. E. Game and Fish Comm., Proc. 21:233-244.

Bigelow, H. B. and W. C. Schroeder. 1953. Fishes of the Gulf of Maine. U. S. Fish and Wildl. Svc. Fish. Bull., 53:(74).

Cairns, J. 1968. Suspended solids standards for the protection of aquatic organisms. Purdue Univ. Eng. Bull. 129:16-27.

Chesapeake Biological Laboratory (Univ. Md.), Chesapeake Bay Institute (The Johns Hopkins Univ.), and College of Marine Studies (Univ. Del.). 1972. Hydrographic and ecological effects of enlargement of the Chesapeake and Delaware Canal. Summary of interim findings. Report to the Phila. Dist., U. S. Army Corps of Engineers. 36 pp.

Chesapeake Biological Laboratory (Univ. Md.), Chesapeake Bay Institute (The Johns Hopkins Univ.), and College of Marine Studies (Univ. Del.). 1973. Hydrographic and ecological effects of enlargement of the Chesapeake and Delaware Canal., Final Report. Summary of research findings. Report to the Phila. Dist., U. S. Army Corps of Engineers. 137 p. plus 15 Appendices.

Cronin, L. E., D. W. Pritchard, T. S. Y. Koo and V. Lotrich. 1977. Effects of enlargement of the Chesapeake and Delaware Canal, pp. 18-32 *in* Estuarine Processes, Vol. 2, Circulation, Sediments and Transfer of Material in the Estuary, Wiley, M. (ed.), Academic Press, N. Y.

Davis, H. C. 1960. Effects of turbidity-producing materials in sea water on eggs and larvae of the clam (*Venus* (*Mercenaria*) *mercenaria*). Biol. Bull. 18:48-54.

_____, and H. Hidu. 1969. Effects of turbidity-producing substances in sea water on eggs and larvae of three genera of bivalve mollusks. The Veliger 11:316-323.

Gray, R. D. 1967. The National Waterway. A History of the Chesapeake and Delaware Canal, 1769-1965. Univ. of Illinois Press, Urbana. 279 pp.

Griffin, L. E. 1938. Experiments on tolerance of young trout and salmon for suspended sediment in water. Oregon State Dept. of Geology and Mineral Industries, Bull. 10 (Appendix B):28-31.

Hildebrand, S. F. and W. C. Schroeder. 1928. Fishes of Chesapeake Bay. Bull. U. S. Bureau Fish., XLIII, Pt. 1, 366 pp.

Johnson, R. K. 1973. Production and distribution of fish eggs and larvae in the Chesapeake and Delaware Canal. Appendix 1 to Ches. Biol. Lab. (Univ. of Md.), Chesapeake Bay Institute (The Johns Hopkins Univ.), and College of Marine Studies (Univ. Del.). 1972. Hydrographic and ecological effects of enlargement of the Chesapeake and Delaware Canal. Final Report. Summary of research findings. Report to the Phila. Dist., U. S. Army Corps of Engineers. 137 pp. plus 15 Appendices.

_____, and T. S. Y. Koo. 1973. Production and distribution of striped bass (*Morone saxatilis*) eggs in the Chesapeake and Delaware Canal. Ches. Sci. 16(1):39-55.

Mansueti, R. J. 1958. Eggs, larvae and young of the striped bass, *Roccus saxatilis*. Chesapeake Biol. Lab. Contr. 112:35 pp.

_____. 1961. Effects of civilization on striped bass and other estuarine biota in Chesapeake Bay and tributaries. Proc. Gulf and Carib. Fish. Inst., 4th Ann. Sess. pp. 110-136.

Morgan, R. P. and V. J. Rasin, Jr. 1973. Effects of salinity and temperature on the development of eggs and larvae os striped bass add white perch. Appendix X to Ches. Biol. Lab. (Univ. Md.), Chesapeake Bay Institute (The Johns Hopkins Iniv.), and College of Marine Studies (Univ. Del.). 1973. NRI Ref. 73-109.

Morgan, R. P., V. J. Rasin and L. A. Noe. 1973. Effects of suspended sediments on the development of eggs and larvae of striped bass and white perch. Appendix XI to Ches. Biol. Lab. (Univ. Md.), Chesapeake Bay Institute (The Johns Hopkins Univ.), and College of Marine Studies (Univ. Del.). 1972. Hydrographic and ecological effects of enlargement of the Chesapeake and Delaware Canal. Final Report. Summary of research fin ings. Report to the Phila. Dist., U. S. Army Corps of Engineers. 137 pp. plus 15 Appendices.

_____, _____, and _____. 1975. Effects of sediments on larvae development of striped bass, *Morone saxatilis*, and white perch, *Morone americanus*. Unpubl. Manuscript, Center of Environmental and Estuarine Studies, Univ. of Md.

Pritchard, D. W. and G. B. Gardner. 1974. Hydrography of the Chesapeake and Delaware Canal. Chesapeake Bay Institute Tech. Report 85, Ref. 74-1, the Johns Hopkins University, 77 pp. plus appendices.

Raney, E. C. 1952. The life history of the striped bass, *Roccus saxatilis* (Walbaum). Bull. Bingh. Oceanogr. Coll. 14(1):5-97.

Raney, E. C., E. F. Tresselt, E. H. Hollis, V. D. Vladyaov and D. H. Wallace. 1952. The striped bass, *Roccus saxatilis*. Bull. Bingh. Oceanogr. Coll. 14(1):177 pp.

Rives, S. R. 1977. Adaptation of J. R. Hunter's one-dimensional model to the Chesapeake and Delaware Canal system. Chesapeake Bay Institute, Special Report 60, Ref. 77-2. (in press)

Schiemer, E. W. and D. W. Pritchard. 1961. An induction conductivity temperature indicator. Chesapeake Bay Institute Tech. Report. 25, Ref. 61-4, 75 pp.

Schubel, J. R. 1968. Suspended sediment of the northern Chesapeake Bay. Chesapeake Bay Institute Technical Report 35, Ref. 68-2, 264 pp.

_____. 1969. Distribution and transportation of suspended sediment in upper Chesapeake Bay. Chesapeake Bay Institute Technical Report 60, Ref. 69-13, 29 pp.

_____. 1975. Fine particles and water quality in the coastal marine environment. Paper 34-2 *in* International Conference on Environmental Sensing and Assessment, Vol. 2, Inst. of Electrical and Electronics Engineering, Inc., New York.

_____, C. H. Morrow and W. B. Cronin. 1968. Suspended sediment data summary, March 1966-May 1967. Upper Chesapeake Bay (Tolchester to Havre de Grace). Chesapeake Bay Institute Special Report 14, Ref. 68-11. 60 pp

_____ and R. B. Biggs. 1969. Distribution of seston in upper Chesapeake Bay. Ches. Sci. 10(1):18-23.

_____, E. W. Schiemer and G. M. Schmidt. 1972. A laboratory apparatus for maintaining uniform suspensions of fine grain sediment. Ches. Sci. 13(2):154-156.

_____, A. H. Auld and G. M. Schmidt. 1973. Effects of suspended sediment on the development and hatching success of yellow perch and striped bass eggs. Ann. Conf. S. E. Game and Fish Comm., Proc. 27-7. pp. 689-694.

_____, _____, and G. M. Schmidt. 1974. Effects of suspended sediment on the development and hatching success of yellow perch and striped bass. Chesapeake Bay Institute. Special Report 35, Ref. 74-2.

_____ and J. C. S. Wang. 1973. The effects of suspended sediment on the hatching success of *Perca flavescens* (yellow perch), *Morone americana* (white perch), *Morone saxatilis* (striped bass), and *Alosa pseudoharengus* (alewife) eggs. Chesapeake Bay Institute Special Report 30, Ref. 73-3. 77 pp.

_____, W. B. Cronin and A. H. Auld. 1974a. Preliminary observations of the sizes and settling velocities of the eggs of some Chesapeake Bay fishes. Chesapeake Bay Institute Special Report 36, Ref. 74-4. 7 pp.

_____, _____, and G. M. Schmidt. 1974b. Some observations of the sizes and settling velocities of fish eggs. Chesapeake Bay Institute Special Report 37, Ref. 74-5. 27 pp.

Sherk, J. A., Jr. 1972. Current status of the knowledge of the biological effects of suspended and redeposited sediments in Chesapeake Bay. Ches. Sci. 13 (suppl.): s137-s144.

Talbot, G. B. 1966. Estuarine environmental requirements and limiting factors for striped bass. Amer. Fish. Soc. Spec. Publ. 3:37-49.

Wakeman, T., R. Peddicord and J. Sustar. 1975. Effects of suspended solids associated with dredging operations on estuarine organisms. *in* E. Herz, ed. Ocean '75 Record Proc. 11 Ann. Conf. Marine Technology Society. pp. 431-436.

APPENDIX A

SUMMARY OF OBSERVATIONS

STATION	924 QQ	WEATHER	02
DEPTH	11.6 m	WIND DIR.	290°
DATE	11 March '71	WIND SPEED	16 k
TIME	1155	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.51	0.09	18.03	
2.0	3.49	0.10	18.63	
4.0	3.45	0.11	16.84	
6.0	3.44	0.11	21.83	
8.0	3.41	0.11	29.76	
10.0	3.42	0.11	62.73	
11.0	3.49	0.11		

STATION	926 UU	WEATHER	02
DEPTH	11.0 m	WIND DIR.	290°
DATE	11 March '71	WIND SPEED	22 k
TIME	1225	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.45	0.10	32.72	
2.0	3.45	0.10	32.63	
4.0	3.35	0.11	41.31	
6.0	3.33	0.10	45.80	
8.0	3.32	0.10	50.13	
10.0	3.38	0.10	63.39	

STATION	O T Pt	WEATHER	02
DEPTH	11.6 m	WIND DIR.	290°
DATE	11 March '71	WIND SPEED	16 k
TIME	1310	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.45	0.10	127.27	
2.0	3.43	0.10	121.40	
4.0	3.36	0.11	153.85	
6.0	3.33	0.11	160.09	
8.0	3.33	0.11	173.38	
10.0	3.33	0.11	185.65	

STATION	C & D 1	WEATHER	02
DEPTH	12.2 m	WIND DIR.	290°
DATE	11 March '71	WIND SPEED	16 k
TIME	1335	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.81	0.21	137.64	
2.0	3.75	0.21	149.86	
4.0	3.64	0.20	164.12	
6.0	3.65	0.23	168.28	
8.0	3.66	0.24	193.37	
10.0	3.69	0.25	190.23	
12.0	3.73	0.25	250.70	

STATION	C & D 2	WEATHER	02
DEPTH	12.2 m	WIND DIR.	315°
DATE	11 March '71	WIND SPEED	24 k
TIME	1405	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.32	0.79	117.63	
2.0	4.30	0.79	121.74	
4.0	4.31	0.82	127.79	
6.0	4.25	0.84	203.93	
8.0	4.24	0.81	273.51	
10.0	4.25	0.83	248.69	
12.0	4.28	0.82	269.32	

STATION	C & D 3	WEATHER	02
DEPTH	11.0 m	WIND DIR.	315°
DATE	11 March '71	WIND SPEED	16 k
TIME	1440	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.49	1.51	111.38	
2.0	4.47	1.53	99.71	
4.0	4.43	1.63	118.56	
6.0	4.41	1.68	153.35	
8.0	4.40	1.72	178.34	
10.0	4.43	1.71	211.20	

STATION	C & D 4	WEATHER	02
DEPTH	12.2 m	WIND DIR.	
DATE	11 March '71	WIND SPEED	
TIME	1500	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.50	1.72	116.71	
2.0	4.45	1.71	119.21	
4.0	4.43	1.73	115.19	
6.0	4.42	1.73	142.10	
8.0	4.40	1.73	176.49	
10.0	4.41	1.74	225.61	
12.0	4.44	1.73		

STATION	C & D 5	WEATHER	02
DEPTH	10.0 m	WIND DIR.	315°
DATE	11 March '71	WIND SPEED	13 k
TIME	1530	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.61	1.76	88.82	
2.0	4.60	1.77	102.81	
4.0	4.60	1.77	137.56	
6.0	4.57	1.79	147.42	
8.0	4.56	1.80	166.43	
10.0	4.56	1.78	1043.52	

STATION	C & D 6	WEATHER	02
DEPTH	10.0 m	WIND DIR.	310°
DATE	11 March '71	WIND SPEED	10 k
TIME	1545	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.85	1.78	83.67	
2.0	4.81	1.75	84.25	
4.0	4.84	1.77	117.12	
6.0	4.63	1.77	138.49	
8.0	4.68	1.74	194.00	
9.0	4.72	1.73		

STATION	C & D 7	WEATHER	02
DEPTH	8.6 m	WIND DIR.	320°
DATE	11 March '71	WIND SPEED	09 k
TIME	1600	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.74	2.15	67.33	
2.0	4.72	2.14	67.08	
4.0	4.62	2.24	79.37	
6.0	4.49	2.33	80.42	
8.0	4.53	2.35	86.89	

STATION	C & D 8	WEATHER	
DEPTH	10.1 m	WIND DIR.	320°
DATE	11 March '71	WIND SPEED	13 k
TIME	1620	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.70	2.02	86.53	
2.0	4.69	2.03	87.17	
4.0	4.63	2.10	101.54	
6.0	4.69	2.16		
8.0	4.50	2.25	65.30	
10.0	4.60	2.15		

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	02
DEPTH	12.2 m	WIND DIR.	
DATE	11 March '71	WIND SPEED	
TIME	1630	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.59	0.55		
2.0	4.57	0.55		
4.0	4.53	0.59		
6.0	4.52	0.61		
8.0	4.52	0.66		
10.0	4.53	0.67		
12.0	4.58	0.69		

STATION	D R 3	WEATHER	02
DEPTH	13.4 m	WIND DIR.	
DATE	11 March '71	WIND SPEED	
TIME	1645	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED (mg/l)	COMB. ORG. (%)
0.0	4.67	0.12		
2.0	4.67	0.12		
4.0	4.67	0.12		
6.0	4.67	0.12		
8.0	4.68	0.12		
10.0	4.70	0.13		
12.0	4.70	0.13		

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	924 QQ	WEATHER	01
DEPTH	11.0 m	WIND DIR.	315°
DATE	23 March '71	WIND SPEED	09 k
TIME	1130	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.07	0.07	45.28	
2.0	4.95	0.09	54.47	
4.0	4.98	0.08	53.15	
6.0	5.00	0.07	58.95	
8.0	4.95	0.09	78.01	
10.0	4.97	0.07	108.63	

STATION	926 UU	WEATHER	00
DEPTH	10.7 m	WIND DIR.	315°
DATE	23 March '71	WIND SPEED	06 k
TIME	1105	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.20	0.11	43.26	
2.0	6.15	0.11	48.11	
4.0	6.01	0.11	69.15	
6.0	6.00	0.11	81.87	
8.0	6.00	0.11	96.74	
10.0	6.02	0.11	158.44	

STATION	O T PT	WEATHER	01
DEPTH	11.6 m	WIND DIR.	315°
DATE	23 March '71	WIND SPEED	13 k
TIME	1030	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.16	0.12	119.87	
2.0	6.18	0.11	108.72	
4.0	6.18	0.11	121.98	
6.0	6.17	0.11	113.75	
8.0	6.16	0.11	118.95	
10.0	6.17	0.11	163.45	
11.0	6.19	0.12	168.29	

STATION	C & D 1	WEATHER	01
DEPTH	11.9 m	WIND DIR.	315°
DATE	23 March '71	WIND SPEED	05 k
TIME	1015	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.30	0.19	168.67	
2.0	6.24	0.19	205.11	
4.0	6.22	0.19	226.82	
6.0	6.22	0.21	238.68	
8.0	6.23	0.19	273.70	
10.0	6.23	0.21	302.90	

STATION	C & D 2	WEATHER	
DEPTH	12.2 m	WIND DIR.	330°
DATE	23 March '71	WIND SPEED	12 k
TIME	0950	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.14	0.35	219.85	
2.0	6.17	0.33	202.40	
4.0	6.18	0.32	236.24	
6.0	6.17	0.38	279.82	
8.0	6.17	0.38		
10.0	6.17	0.37	288.75	
12.0	6.18	0.35	340.20	

STATION	C & D 3	WEATHER	01
DEPTH	8.2 m	WIND DIR.	340°
DATE	23 March '71	WIND SPEED	13 k
TIME	0935	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.15	0.48	190.13	
2.0	6.12	0.54	213.16	
4.0	6.14	0.55	217.29	
6.0	6.13	0.57	254.94	
8.0	6.14	0.58	281.84	

STATION	C & D 4	WEATHER	02
DEPTH	13.4 m	WIND DIR.	
DATE	23 March '71	WIND SPEED	
TIME	0910	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.04	0.76	193.70	
2.0	6.08	0.79	229.17	
4.0	6.10	0.82	225.00	
6.0	6.10	0.86	266.69	
8.0	6.11	0.85	225.78	
10.0	6.11	0.85	305.13	
12.0	6.13	0.75	422.50	

STATION	C & D 5	WEATHER	02
DEPTH	11.7 m	WIND DIR.	
DATE	23 March '71	WIND SPEED	
TIME	0850	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.24	1.32	265.42	
2.0	6.26	1.27	326.63	
4.0	6.27	1.27	315.87	
6.0	6.26	1.23	314.00	
8.0	6.26	1.26	410.49	
10.0	6.26	1.26	502.34	

STATION	C & D 6	WEATHER	02
DEPTH	12.2 m	WIND DIR.	
DATE	23 March '71	WIND SPEED	06 k
TIME	0835	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.21	1.20	234.61	
2.0	6.23	1.24	98.76	
4.0	6.24	1.21	307.84	
6.0	6.24	1.21	301.43	
8.0	6.24	1.24	316.69	
10.0	6.24	1.24	116.22	
12.0	6.24	1.24	348.54	

STATION	C & D 7	WEATHER	01
DEPTH	10.4 m	WIND DIR.	340°
DATE	23 March '71	WIND SPEED	13 k
TIME	0815	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.11	1.32	239.24	
2.0	6.11	1.36	283.58	
4.0	6.14	1.28	238.12	
6.0	6.11	1.35	208.18	
8.0	6.11	1.37	305.89	
10.0	6.11	1.32	208.44	

STATION	C & D 8	WEATHER	
DEPTH	11.6 m	WIND DIR.	
DATE	23 March '71	WIND SPEED	
TIME	0800	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.12	1.17	220.90	
2.0	6.14	1.18	192.91	
4.0	6.14	1.17	210.62	
6.0	6.14	1.17	421.83	
8.0	6.14	1.16	203.85	
10.0	6.12	1.20	190.71	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	01
DEPTH	12.2 m	WIND DIR.	010°
DATE	23 March '71	WIND SPEED	13 k
TIME	0750	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.05	1.64	160.36	
2.0	6.06	1.68	151.18	
4.0	6.05	1.80	237.82	
6.0	6.05	2.04	309.08	
8.0	6.05	2.03	357.14	
10.0	6.05	1.97	392.90	

STATION	D R 3	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	926 UU	WEATHER	00
DEPTH	11.4 m	WIND DIR.	320°
DATE	25 March '71	WIND SPEED	11 k
TIME	1115	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.51	0.12	29.45	
2.0	3.48	0.11	30.81	
4.0	3.46	0.12	33.42	
6.0	3.47	0.11	31.89	
8.0	3.48	0.11	38.00	
10.0	3.54	0.13	53.54	

STATION	O.T. PT.	WEATHER	0C
DEPTH	11.6 m	WIND DIR.	340°
DATE	25 March '71	WIND SPEED	13 k
TIME	1040	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.03	0.11	69.86	
2.0	5.03	0.13	64.62	
4.0	5.02	0.11	63.14	
6.0	5.03	0.13	63.99	
8.0	5.06	0.13	74.47	
10.0	5.11	0.12	77.28	

STATION	C & D 1	WEATHER	00
DEPTH	11.6 m	WIND DIR.	315°
DATE	25 March '71	WIND SPEED	06 k
TIME	1020	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.96	0.12	56.58	
2.0	4.89	0.13	69.46	
4.0	4.93	0.12	72.23	
6.0	4.96	0.12	86.07	
8.0	4.94	0.13	83.35	
10.0	4.95	0.12	90.15	

STATION	C & D 2	WEATHER	
DEPTH	12.8 m	WIND DIR.	315°
DATE	25 March '71	WIND SPEED	11 k
TIME	1000	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.16	0.13	54.83	
2.0	5.11	0.13	67.61	
4.0	5.13	0.13	61.24	
6.0	5.12	0.12	72.95	
8.0	5.13	0.13	74.47	
10.0	5.13	0.14	84.23	
12.0	5.13	0.14	172.77	

STATION	C & D 3	WEATHER	00
DEPTH	11.6 m	WIND DIR.	315°
DATE	25 March '71	WIND SPEED	10 k
TIME	0945	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.07	0.13	46.20	
2.0	5.06	0.15	56.62	
4.0	5.06	0.14	53.87	
6.0	5.06	0.15	60.79	
8.0	5.07	0.15	82.96	
10.0	5.09	0.13	78.53	

STATION	C & D 4	WEATHER	00
DEPTH	12.8 m	WIND DIR.	315°
DATE	25 March '71	WIND SPEED	10 k
TIME	0920	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.08	0.14	57.83	
2.0	5.07	0.15	67.14	
4.0	5.07	0.15	79.63	
6.0	5.08	0.15	80.03	
8.0	5.08	0.14	87.54	
10.0	5.09	0.15	86.96	
12.0	5.10	0.14	113.62	

STATION	C & D 5	WEATHER	00
DEPTH	10.4 m	WIND DIR.	315°
DATE	25 March '71	WIND SPEED	11 k
TIME	0900	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.39	0.14	76.47	
2.0	5.44	0.12	85.85	
4.0	5.46	0.16	102.16	
6.0	5.46	0.14	103.10	
8.0	5.46	0.15	111.44	
10.0	5.47	0.15	149.66	

STATION	C & D 6	WEATHER	00
DEPTH	11.3 m	WIND DIR.	320°
DATE	25 March '71	WIND SPEED	09 k
TIME	0840	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.52	0.16	111.67	
2.0	5.56	0.17	135.47	
4.0	5.57	0.16	146.02	
6.0	5.57	0.16	178.02	
8.0	5.58	0.16	218.60	
10.0	5.58	0.14	245.44	

STATION	C & D 7	WEATHER	00
DEPTH	10.4 m	WIND DIR.	315°
DATE	25 March '71	WIND SPEED	11 k
TIME	0815	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.60	0.17	130.47	
2.0	5.62	0.17	188.38	
4.0	5.64	0.18	205.00	
6.0	5.64	0.15	189.42	
8.0	5.65	0.17	255.01	

STATION	C & D 8	WEATHER	00
DEPTH	10.7 m	WIND DIR.	310°
DATE	25 March '71	WIND SPEED	10 k
TIME	0750	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.62	0.23	185.34	
2.0	5.67	0.22	202.19	
4.0	5.72	0.23	204.26	
6.0	5.72	0.22	223.61	
8.0	5.72	0.24	228.80	
10.0	5.73	0.23	240.19	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	00
DEPTH	11.9 m	WIND DIR.	315°
DATE	25 March '71	WIND SPEED	19 k
TIME	0730	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG. (%)
0.0	5.97	0.35	104.11	
2.0	6.04	0.34	110.28	
4.0	6.09	0.34	118.32	
6.0	6.08	0.37	125.39	
8.0	6.08	0.35	131.60	
10.0	6.09	0.37	139.46	

STATION	D R 3	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	01
DEPTH	12.0 m	WIND DIR.	315°
DATE	30 March '71	WIND SPEED	14 k
TIME	1230	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.68	0.14	36.43	
2.0	5.61	0.14	36.62	
4.0	5.60	0.14	40.68	
6.0	5.61	0.14	40.72	
8.0	5.63	0.15	42.00	
10.0	5.67	0.16	42.59	

STATION	926 UU	WEATHER	01
DEPTH	11.3 m	WIND DIR.	315°
DATE	30 March '71	WIND SPEED	10 k
TIME	1300	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.21	0.13	31.77	
2.0	6.20	0.13	32.58	
4.0	6.18	0.13	33.41	
6.0	6.14	0.14	34.83	
8.0	6.15	0.14	40.31	
10.0	6.20	0.14	39.56	

STATION	O T PT	WEATHER	01
DEPTH	12.3 m	WIND DIR.	315°
DATE	30 March '71	WIND SPEED	15 k
TIME	1340	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.21	0.47	64.94	
2.0	6.21	0.46	72.56	
4.0	6.24	0.48	68.47	
6.0	6.24	0.50	71.98	
8.0	6.23	0.50	89.10	
10.0	6.17	0.49	105.93	
12.0	6.18	0.49		

STATION	C & D 1	WEATHER	01
DEPTH	12.2 m	WIND DIR.	340°
DATE	30 March '71	WIND SPEED	08 k
TIME	1405	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.31	0.70	66.04	
2.0	6.31	0.71	75.47	
4.0	6.31	0.71	75.57	
6.0	6.34	0.73	95.14	
8.0	6.38	0.75	100.85	
10.0	6.46	0.78	110.72	

STATION	C & D 2	WEATHER	01
DEPTH	12.2 m	WIND DIR	315°
DATE	30 March '71	WIND SPEED	17 k
TIME	1425	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.28	0.80	76.81	
2.0	6.28	0.80	80.32	
4.0	6.30	0.82	97.13	
6.0	6.30	0.81	92.13	
8.0	6.30	0.81	100.17	
10.0	6.34	0.82	105.45	
12.0	6.36	0.82		

STATION	C & D 3	WEATHER	01
DEPTH	12.0 m	WIND DIR.	315°
DATE	30 March '71	WIND SPEED	16 k
TIME	1445	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.63	0.87	75.89	
2.0	5.65	0.86	70.65	
4.0	5.62	0.87	82.76	
6.0	5.61	0.87	86.95	
8.0	5.61	0.87	91.93	
10.0	5.62	0.87	98.25	

STATION	C & D 4	WEATHER	01
DEPTH	12.2 m	WIND DIR.	315°
DATE	30 March '71	WIND SPEED	09 k
TIME	1500	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.41	0.92	77.78	
2.0	6.40	0.91	84.73	
4.0	6.40	0.92	87.96	
6.0	6.40	0.91	104.92	
8.0	6.41	0.91	105.28	
10.0	6.41	0.92	116.43	
12.0	6.43	0.91		

STATION	C & D 5	WEATHER	01
DEPTH	11.5 m	WIND DIR.	300°
DATE	30 March '71	WIND SPEED	12 k
TIME	1530	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.51	0.97	75.13	
2.0	6.51	0.96	79.13	
4.0	6.52	0.96	89.00	
6.0	6.51	0.97	93.56	
8.0	6.47	0.97	127.96	
10.0	6.47	0.97	139.82	

STATION	C & D 6	WEATHER	01
DEPTH	11.0 m	WIND DIR.	320°
DATE	30 March '71	WIND SPEED	02 k
TIME	1545	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.46	1.07	75.78	
2.0	6.48	1.07	78.46	
4.0	6.47	1.07	85.86	
6.0	6.45	1.08	121.54	
8.0	6.43	1.08	125.96	
10.0	6.43	1.09		

STATION	C & D 7	WEATHER	01
DEPTH	9.8 m	WIND DIR.	315°
DATE	30 March '71	WIND SPEED	17 k
TIME	1610	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.38	1.20	75.57	
2.0	6.40	1.20	88.11	
4.0	6.41	1.20	87.06	
6.0	6.41	1.20	106.53	
8.0	6.39	1.23	108.17	

STATION	C & D 8	WEATHER	01
DEPTH	11.0 m	WIND DIR.	340°
DATE	30 March '71	WIND SPEED	13 k
TIME	1630	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.56	1.42	150.42	
2.0	6.59	1.41	219.72	
4.0	6.59	1.41	293.91	
6.0	6.60	1.42	266.84	
8.0	6.61	1.42	73.07	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	01
DEPTH	12.3 m	WIND DIR.	340°
DATE	30 March '71	WIND SPEED	16 k
TIME	1640	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.31	1.45	71.18	
2.0	6.31	1.45	72.83	
4.0	6.30	1.51	76.41	
6.0	6.29	1.57	82.80	
8.0	6.28	1.63	100.22	
10.0	6.27	1.67	106.46	
12.0	6.26	1.72		

STATION	D R 3	WEATHER	01
DEPTH	12.8 m	WIND DIR.	315°
DATE	30 March '71	WIND SPEED	15 k
TIME	1720	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.54	0.68		
2.0	6.53	0.68		
4.0	6.55	0.69		
6.0	6.53	0.71		
8.0	6.49	0.76		
10.0	6.48	0.80		
12.0	6.46	0.86		

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	04
DEPTH	13.7 m	WIND DIR.	
DATE	18 Aug. '71	WIND SPEED	03 k
TIME	1300	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	26.88	0.81	11.62	
2.0	26.69	0.88	14.16	
4.0	26.41	0.98	21.26	
6.0	26.32	1.10	19.06	
8.0	26.30	1.31	21.45	
10.0	26.27	1.81	33.71	
11.0	26.27	1.87	39.62	

STATION	926 UU	WEATHER	04
DEPTH	13.7 m	WIND DIR.	000°
DATE	18 Aug. '71	WIND SPEED	03 k
TIME	1328	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0			25.63	
2.0	26.58	0.51	28.12	
4.0	26.52	0.52	31.79	
6.0	26.52	0.53	35.59	
8.0	26.50	0.55	41.91	
10.0	26.39	0.60		
10.8			303.13	
11.1	26.40	0.59		

STATION	O T PT	WEATHER	01
DEPTH	14.6 m	WIND DIR.	
DATE	18 Aug. '71	WIND SPEED	00 k
TIME	1400	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	27.71	0.90	21.76	
2.0	27.06	0.91	24.54	
4.0	26.87	0.96	29.19	
6.0	26.87	0.98	29.64	
8.0	26.91	1.02	34.42	
10.0	26.92	1.05	41.95	
12.0	26.96	1.04	60.98	

STATION	C & D 1	WEATHER	04
DEPTH	14.6 m	WIND DIR.	
DATE	18 Aug. '71	WIND SPEED	00 k
TIME	1420	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	27.45	1.06	19.20	
2.0	27.19	1.05	21.00	
4.0	26.90	1.09	20.91	
6.0	26.86	1.10	25.21	
8.0	26.84	1.10	29.00	
10.0	26.83	1.09	29.30	
11.6	26.87	1.10	50.88	

STATION	C & D 2	WEATHER	04
DEPTH	13.2 m	WIND DIR.	
DATE	18 Aug. '71	WIND SPEED	00 k
TIME	1445	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	27.28	1.26	20.25	
2.0	27.05	1.27	19.42	
4.0	27.03	1.27	21.29	
6.0	27.04	1.27	20.65	
8.0	27.02	1.26	20.35	
10.0	26.94	1.28	25.51	
12.7	27.06	1.29	52.05	

STATION	C & D 3	WEATHER	04
DEPTH	13.4 m	WIND DIR.	090°
DATE	18 Aug. '71	WIND SPEED	05 k
TIME	1519	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	27.27	1.37	20.09	
2.0	27.06	1.40	21.26	
4.0	27.00	1.36	20.17	
6.0	27.00	1.36	19.93	
8.0	26.98	1.37	21.02	
10.0	26.91	1.39	35.12	
10.9	26.92	1.38	380.69	

STATION	C & D 4	WEATHER	04
DEPTH	14.3 m	WIND DIR.	090°
DATE	18 Aug. '71	WIND SPEED	07 k
TIME	1533	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	27.27	1.48	23.90	
2.0	27.00	1.53	18.62	
4.0	26.92	1.53	19.95	
6.0	26.90	1.56	25.76	
8.0	26.85	1.54	34.14	
10.0	26.84	1.58	46.08	
11.5	26.87	1.60	149.54	

STATION	C & D 5	WEATHER	04
DEPTH	12.5 m	WIND DIR.	090°
DATE	18 Aug. '71	WIND SPEED	06 k
TIME	1550	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	27.23	1.83	17.49	
2.0	27.06	1.89	29.64	
4.0	26.98	1.92	62.11	
6.0	26.94	1.93	84.94	
8.0	26.94	1.95	76.96	
10.0	26.94	1.95	101.13	
12.3	26.92	1.95	232.13	

STATION	C & D 6	WEATHER	02
DEPTH	12.0 m	WIND DIR.	090°
DATE	18 Aug. '71	WIND SPEED	05 k
TIME	1610	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED. (mg/l)	COMB ORG (%)
0.0	26.96	2.21	70.16	
2.0	26.96	2.22	87.59	
4.0	26.94	2.24	91.97	
6.0	26.93	2.27	118.53	
8.0	26.93	2.28	161.33	
10.0	26.95	2.32	265.29	

STATION	C & D 7	WEATHER	01
DEPTH	11.0 m	WIND DIR.	090°
DATE	18 Aug. '71	WIND SPEED	06 k
TIME	1620	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	26.99	2.69	56.58	
2.0	26.98	2.71	81.95	
4.0	26.99	2.72	110.05	
6.0	26.99	2.73	134.41	
8.5	27.02	2.74	192.43	

STATION	C & D 8	WEATHER	01
DEPTH	12.2 m	WIND DIR	
DATE	18 Aug. '71	WIND SPEED	
TIME	1635	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED. (mg/l)	COMB ORG (%)
0.0	26.91	3.21	99.13	
2.0	26.95	3.13	119.58	
4.0	26.94	3.10	129.95	
6.0	26.93	3.10	143.46	
8.0	26.92	3.09	144.61	
10.3	26.90	3.10	155.83	

STATION	D R 1	WEATHER	
DEPTH	13.0 m	WIND DIR.	230°
DATE	18 Aug. '71	WIND SPEED	10 k
TIME	1715	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED. (mg/l)	COMB ORG (%)
0.0	27.02	1.02	49.08	
2.0	27.10	1.06	51.84	
4.0	27.11	1.06	78.56	
6.0	27.11	1.08	85.28	
8.0	27.12	1.09	84.87	
10.0	27.13	1.10	98.60	
12.8	27.09	1.20	167.20	

STATION	D R 2	WEATHER	01
DEPTH	16.5 m	WIND DIR.	225°
DATE	18 Aug. '71	WIND SPEED	12 k
TIME	1645	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	27.00	1.74	36.22	
2.0	27.00	1.89	52.13	
4.0	26.96	1.95	60.02	
6.0	26.94	2.15	85.82	
8.0	26.97	2.19	93.07	
10.0	27.08	2.30	119.58	
12.0	27.11	2.62	119.78	
13.5	27.11	2.74		

STATION	D R 3	WEATHER	01
DEPTH	14.2 m	WIND DIR.	200°
DATE	18 Aug. '71	WIND SPEED	15 k
TIME	1805	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	26.46	3.78	22.04	
2.0	26.48	3.79	23.97	
4.0	26.44	4.25	24.84	
6.0	26.43	4.52	31.84	
8.0	26.42	4.82	61.53	
10.0	26.44	4.89	65.95	
12.0	26.45	4.92	115.21	
14.0	26.41	4.90	572.62	

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	06
DEPTH	13.7 m	WIND DIR.	090°
DATE	27 Aug. '71	WIND SPEED	07 k
TIME	0602	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	24.74	0.97	11.08	
2.0	24.85	1.08	11.23	
4.0	24.92	1.33	11.62	
6.0	24.94	1.58	15.05	
8.0	25.02	1.98	13.74	
10.0	25.08	2.51	20.49	
12.3	25.08	2.76	42.93	

STATION	926 UU	WEATHER	06
DEPTH	13.1 m	WIND DIR.	090°
DATE	27 Aug. '71	WIND SPEED	06 k
TIME	0630	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.13	0.53	20.26	
2.0	25.14	0.53	21.96	
4.0	25.14	0.55	22.00	
6.0	25.13	0.59	22.83	
8.0	25.13	0.67	28.80	
10.0	25.08	1.34	99.21	
11.6	25.10	1.57	98.77	

STATION	O T PT.	WEATHER	06
DEPTH	14.0 m	WIND DIR.	115°
DATE	27 Aug. '71	WIND SPEED	04 k
TIME	0720	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.35	0.83	19.17	
2.0	25.40	0.82	25.54	
4.0	25.39	0.81	28.15	
6.0	25.39	0.85	27.82	
8.0	25.39	0.82	32.68	
10.0	25.40	0.82	40.26	
12.3	25.40	0.82	47.95	

STATION	C & D 1	WEATHER	06
DEPTH	13.4 m	WIND DIR.	
DATE	27 Aug. '71	WIND SPEED	
TIME	0740	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0			31.55	
2.0				
4.0				
6.0				
8.0				
10.0			26.52	
12.0	25.30	0.86	-	

STATION	C & D 2	WEATHER	06
DEPTH		WIND DIR.	
DATE	27 Aug. '71	WIND SPEED	
TIME	0920	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.41	1.02	23.61	
2.0	25.41	1.00	36.53	
4.0	25.42	1.01	50.06	
6.0	25.43	1.01	60.95	
8.0	25.43	1.00	61.49	
10.0	25.44	0.99	62.92	
12.5	25.36	0.99	135.75	

STATION	C & D 3	WEATHER	06
DEPTH	12.8 m	WIND DIR.	245°
DATE	27 Aug. '71	WIND SPEED	03 k
TIME	0935	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.54	1.09	29.64	
2.0	25.54	1.09	33.56	
4.0	25.54	1.10	31.87	
6.0	25.55	1.10	32.27	
8.0	25.55	1.10	38.67	
10.0	25.55	1.10	42.82	
11.5	25.55	1.09	2703.10	

STATION	C & D 4	WEATHER	06
DEPTH	12.8 m	WIND DIR.	
DATE	27 Aug. '71	WIND SPEED	00 k
TIME	0945	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	25.58	1.20	24.51	
2.0	25.59	1.21	34.94	
4.0	25.60	1.20	51.56	
6.0	25.61	1.20	51.64	
8.0	25.61	1.21	61.04	
10.0	25.60	1.20	71.56	
11.5	25.59	1.19	162.28	

STATION	C & D 5	WEATHER	06
DEPTH	14.3 m	WIND DIR	245°
DATE	27 Aug. '71	WIND SPEED	13 k
TIME	1005	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	25.53	1.76	28.39	
2.0	25.69	1.99	49.54	
4.0	25.70	2.00	66.74	
6.0	25.71	2.12	83.83	
8.0	25.72	2.14	107.95	
10.0	25.72	2.19	109.37	
12.0	25.72	2.23	111.08	
13.0	25.69	2.21	545.81	

STATION	C & D 6	WEATHER	06
DEPTH	12.2 m	WIND DIR.	
DATE	27 Aug. '71	WIND SPEED	13 k
TIME	1015	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	25.48	2.66	63.68	
2.0	25.50	2.69	74.42	
4.0	25.50	2.84	85.25	
6.0	25.45	2.91	94.90	
8.0	25.50	2.96	100.67	
10.7	25.42	3.26	109.09	

STATION	C & D 7	WEATHER	06
DEPTH	11.0 m	WIND DIR.	270°
DATE	27 Aug. '71	WIND SPEED	10 k
TIME	1030	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	25.07	4.02	59.97	
2.0	25.08	4.02	53.59	
4.0	25.09	4.01	71.31	
6.0	25.11	4.04	67.71	
8.0	25.12	4.08	96.90	
10.0	25.04	4.05	96.59	

STATION	C & D 8	WEATHER	06
DEPTH	12.2 m	WIND DIR.	270°
DATE	27 Aug. '71	WIND SPEED	10 k
TIME	1045	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	24.77	4.80	86.79	
2.0	24.71	4.87	101.59	
4.0	24.71	4.87	109.13	
6.0	24.72	4.86	109.71	
8.0	24.73	4.86	117.77	
10.0	24.70	4.81	128.57	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	D R 2	WEATHER	06
DEPTH	15.8 m	WIND DIR.	270°
DATE	27 Aug. '71	WIND SPEED	14 k
TIME	1054	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.20	2.57	26.02	
2.0	25.18	2.67	30.00	
4.0	25.14	2.92	44.11	
6.0	25.16	2.91	40.75	
8.0	25.16	2.99	43.98	
10.0	25.10	3.59	57.91	
12.0	24.94	4.65	110.35	
13.5	24.96	4.61	438.72	

STATION	D R 3	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	924 QQ	WEATHER	04
DEPTH	12.5 m	WIND DIR.	135°
DATE	8 Sept. '71	WIND SPEED	05 k
TIME	0405	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.06	1.30	10.73	
2.0	25.09	1.35	14.37	
4.0	25.20	1.52	16.36	
6.0	25.17	1.62	20.82	
8.0	25.01	1.86	29.02	
10.0	25.07	2.05	392.04	
11.0	25.08	2.04	57.93	

STATION	926 UU	WEATHER	
DEPTH	11.6 m	WIND DIR.	150°
DATE	8 Sept. '71	WIND SPEED	05 k
TIME	0443	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0			33.87	
2.0	25.42	0.61	27.93	
4.0	25.41	0.62	29.96	
6.0	25.38	0.62	37.02	
8.0	25.36	0.62	59.46	
10.0	25.33	0.63	89.82	

STATION	O T PT	WEATHER	
DEPTH	11.6 m	WIND DIR.	090°
DATE	8 Sept. '71	WIND SPEED	04 k
TIME	0525	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.59	0.70	24.25	
2.0	25.62	0.70	32.63	
4.0	25.60	0.70	54.87	
6.0	25.58	0.70	58.95	
7.0	25.53	0.70	55.83	

STATION	C & D 1	WEATHER	04
DEPTH	12.5 m	WIND DIR.	150°
DATE	8 Sept. '71	WIND SPEED	03 k
TIME	0550	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.55	0.73	24.07	
2.0	25.54	0.74	26.49	
4.0	25.52	0.75	27.70	
6.0	25.49	0.77	31.19	
8.0	25.44	0.79	34.86	
10.0	25.43	0.79	42.87	
11.0	25.41	0.79	45.79	

STATION	C & D 2	WEATHER	04
DEPTH	12.5 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	
TIME	0618	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.20	1.12	29.39	
2.0	25.22	1.12	29.02	
4.0	25.22	1.13	31.42	
6.0	25.20	1.17	35.91	
8.0	25.17	1.20	50.57	
10.0	25.17	1.22	41.00	
12.0	25.16	1.23	54.69	

STATION	C & D 3	WEATHER	04
DEPTH	11.6 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	
TIME	0640	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.09	1.60	19.46	
2.0	25.17	1.66	22.47	
4.0	25.16	1.72	23.08	
6.0	25.16	1.81	27.31	
8.0	25.15	1.84	36.74	
10.0	25.05	1.85	51.34	

STATION	C & D 4	WEATHER	04
DEPTH	12.5 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	
TIME	0655	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	-	-	19.11	
2.0	25.11	2.18	26.48	
4.0	25.12	2.26	24.51	
6.0	25.12	2.31	26.09	
8.0	25.11	2.37	26.62	
10.0	25.11	2.40	38.70	
11.0	25.00	2.40	56.68	

STATION	C & D 5	WEATHER	04
DEPTH	12.8 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	
TIME	0715	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	-	-	56.02	
2.0	25.11	2.65	49.91	
4.0	25.12	2.65	91.89	
6.0	25.11	2.65	131.81	
8.0	25.11	2.64	113.13	
10.0	25.11	2.64	111.23	
11.0	25.03	2.65	173.78	

STATION	C & D 6	WEATHER	04
DEPTH	10.6 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	
TIME	0730	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.08	2.79	101.97	
2.0	25.14	2.78	108.56	
4.0	25.14	2.79	104.76	
6.0	25.14	2.79	101.11	
8.0	25.11	2.79	117.30	
10.0	25.00	2.80	196.70	

STATION	C & D 7	WEATHER	04
DEPTH	9.8 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	
TIME	0748	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.02	2.99	172.97	
2.0	25.02	2.98	172.81	
4.0	24.97	2.98	167.29	
6.0	24.99	2.97	220.74	
8.0	25.01	2.95	256.38	
9.0	25.00	2.99	335.79	

STATION	C & D 8	WEATHER	04
DEPTH	11.3 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	
TIME	0800	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.01	3.00	192.23	
2.0	25.01	3.01	210.27	
4.0	25.02	3.00	238.22	
6.0	25.06	3.02	258.70	
8.0	25.04	3.00	254.90	
10.0	24.96	3.01	262.24	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	02
DEPTH	12.0 m	WIND DIR.	240°
DATE	8 Sept. '71	WIND SPEED	05 k
TIME	0815	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.17	1.30	72.30	
2.0	25.17	1.32	85.03	
4.0	25.19	1.38	115.48	
6.0	25.19	1.38	136.84	
8.0	25.19	1.41	155.27	
10.0	25.19	1.50	195.77	
11.5	25.17	1.54	536.86	

STATION	D R 3	WEATHER	04
DEPTH	14.6 m	WIND DIR.	
DATE	8 Sept. '71	WIND SPEED	00 k
TIME	0855	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	25.10	0.48	55.68	
2.0	25.07	0.48	82.22	
4.0	25.07	0.49	80.70	
6.0	25.05	0.49	101.43	
8.0	25.06	0.49	117.49	
10.0	25.02	0.45	231.51	
12.0	25.05	0.46	465.07	

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	00
DEPTH	13.4 m	WIND DIR.	045°
DATE	19 Oct. '71	WIND SPEED	13 k
TIME	1420	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	17.77	1.52	16.12	
2.0	17.68	1.56	15.01	
4.0	17.49	1.79	13.89	
6.0	17.52	2.10	12.99	
8.0	17.73	3.61	12.89	
10.0	17.98	4.52	18.57	
12.5	18.17	4.88		
12.6			26.05	

STATION	926 UU	WEATHER	00
DEPTH	12.8 m	WIND DIR.	045°
DATE	19 Oct. '71	WIND SPEED	12 k
TIME	1446	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	17.90	1.86	35.86	
2.0	17.90	1.88	40.77	
4.0	17.90	1.86	45.96	
6.0	17.91	1.87	50.71	
8.0	17.92	1.87	53.77	
10.0	17.91	1.87	60.55	
11.0	17.99	1.88	79.64	

STATION	O T PT	WEATHER	00
DEPTH	13.1 m	WIND DIR.	080°
DATE	19 Oct. '71	WIND SPEED	12 k
TIME	1520	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.07	2.29	48.96	
2.0	18.09	2.36	57.51	
4.0	18.09	2.39	62.58	
6.0	18.09	2.43	96.73	
8.0	18.10	2.46	160.49	
10.0	18.12	2.51	210.05	
12.0	18.18	2.50		

STATION	C & D 1	WEATHER	00
DEPTH	13.4 m	WIND DIR.	090°
DATE	19 Oct. '71	WIND SPEED	14 k
TIME	1540	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.03	3.19	48.78	
2.0	18.03	3.19	54.67	
4.0	18.03	3.23	59.66	
6.0	18.03	3.24	92.34	
8.0	18.04	3.26	120.75	
10.0	18.07	3.23	311.18	
12.0	18.11	3.28		

STATION	C & D 2	WEATHER	00
DEPTH	14.0 m	WIND DIR.	090°
DATE	19 Oct. '71	WIND SPEED	10 k
TIME	1600	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	17.84	3.28	29.29	
2.0	17.89	3.38	35.19	
4.0	17.89	3.40	41.97	
6.0	17.92	3.47	102.00	
8.0	17.92	3.45	157.98	
10.0	17.94	3.46	190.24	
12.0	17.97	3.44	245.86	
13.0	18.06	3.45	500.77	

STATION	C & D 3	WEATHER	00
DEPTH	12.2 m	WIND DIR.	070°
DATE	19 Oct. '71	WIND SPEED	10 k
TIME	1655	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	17.74	3.15	29.53	
2.0	17.77	3.13	33.74	
4.0	17.80	3.17	32.90	
6.0	17.86	3.22	37.36	
8.0	17.89	3.31	37.64	
10.0	17.92	3.41	35.58	
11.0	17.98	3.44	39.25	

STATION	C & D 4	WEATHER	00
DEPTH	13.1 m	WIND DIR.	090°
DATE	19 Oct. '71	WIND SPEED	09 k
TIME	1710	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG (%)
0.0	17.68	3.18	29.24	
2.0	17.69	3.20	32.24	
4.0	17.69	3.21	34.40	
6.0	17.71	3.22	34.62	
8.0	17.71	3.26	34.57	
10.0	17.74	3.27	35.10	
12.0	17.77	3.25	36.11	

STATION	C & D 5	WEATHER	00
DEPTH	14.0 m	WIND DIR.	090°
DATE	19 Oct. '71	WIND SPEED	07 k
TIME	1730	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG (%)
0.0	17.72	3.40	28.24	
2.0	17.78	3.41	27.83	
4.0	17.80	3.42	28.86	
6.0	17.81	3.46	29.62	
8.0	17.84	3.50	31.36	
10.0	17.85	3.55	33.55	
12.0	17.85	3.53	35.85	

STATION	C & D 6	WEATHER	00
DEPTH	11.0 m	WIND DIR.	060°
DATE	19 Oct. '71	WIND SPEED	09 k
TIME	1745	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	17.75	3.91	24.27	
2.0	17.87	4.05	24.11	
4.0	17.89	4.06	31.05	
6.0	17.90	4.09	64.07	
8.0	17.89	4.14	85.68	
10.0	17.80	4.13	181.05	

STATION	C & D 7	WEATHER	00
DEPTH	10.4 m	WIND DIR.	090°
DATE	19 Oct. '71	WIND SPEED	08 k
TIME	1755	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	17.86	3.63	31.03	
2.0	17.86	3.68	37.53	
4.0	17.91	3.92	101.96	
6.0	17.91	4.02	142.94	
8.0	17.90	4.04	380.27	
9.0	17.98	4.01	720.58	

STATION	C & D 8	WEATHER	00
DEPTH	11.6 m	WIND DIR.	090°
DATE	19 Oct. '71	WIND SPEED	12 k
TIME	1810	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB. ORG (%)
0.0	17.90	3.18	100.41	
2.0	17.93	3.18	138.17	
4.0	17.95	3.17	203.05	
6.0	17.97	3.14	474.48	
8.0	18.00	3.11	535.96	
10.0	17.90	3.14	907.70	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	D R 2	WEATHER	00
DEPTH	14.6 m	WIND DIR.	090°
DATE	19 Oct. '71	WIND SPEED	12 k
TIME	1820	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.10	1.09	52.98	
2.0	18.13	1.12	62.49	
4.0	18.13	1.09	60.54	
6.0	18.20	1.10	69.89	
8.0	18.22	1.11	91.36	
10.0	18.20	1.12	133.40	
12.0	18.18	1.14	189.21	
13.0	18.14	1.15	362.00	

STATION	D R 3	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	924 QQ	WEATHER	02
DEPTH	12.2 m	WIND DIR.	101°
DATE	16 Nov. '71	WIND SPEED	17 k
TIME	1420	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	10.00	0.94	13.79	
2.0	9.98	0.93	12.31	
4.0	9.96	0.94	11.82	
6.0	9.97	1.10	15.33	
8.0	9.99	1.20	32.58	
10.0	10.57	2.69	22.72	
11.5	10.75	2.96	273.42	

STATION	926 UU	WEATHER	02
DEPTH	12.2 m	WIND DIR.	010°
DATE	16 Nov. '71	WIND SPEED	09 k
TIME	1450	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	9.84	0.80	19.89	
2.0	9.82	0.80	16.59	
4.0	9.78	0.82	22.17	
6.0	9.78	0.82	24.25	
8.0	9.78	0.82	104.74	
10.0	9.79	0.83	245.81	
11.5	9.80	0.83	466.39	

STATION	O T PT	WEATHER	02
DEPTH	11.9 m	WIND DIR.	010°
DATE	16 Nov. '71	WIND SPEED	09 k
TIME	1530	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	10.38	1.22	23.53	
2.0	10.39	1.23	25.72	
4.0	10.36	1.23	27.39	
6.0	10.39	1.27	29.19	
8.0	10.50	1.42	36.85	
10.0	10.55	1.42	41.90	

STATION	C & D 1	WEATHER	01
DEPTH	12.2 m	WIND DIR.	010°
DATE	16 Nov. '71	WIND SPEED	06 k
TIME	1555	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	10.70	1.39	25.91	
2.0	10.71	1.42	25.16	
4.0	11.22	2.53	46.36	
6.0	11.26	2.61	54.97	
8.0	11.28	2.62	59.68	
10.0	11.28	2.63	67.50	
12.0	11.30	2.63	80.37	

STATION	C & D 2	WEATHER	01
DEPTH	12.8 m	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	
TIME	1615	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	11.62	3.44	46.29	
2.0	11.64	3.46	44.37	
4.0	11.66	3.49	51.03	
6.0	11.68	3.49	55.67	
8.0	11.69	3.51	52.56	
10.0	11.73	3.57	44.93	
12.5	11.74	3.60	52.96	

STATION	C & D 3	WEATHER	01
DEPTH	11.3	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	
TIME	1635	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	11.80	3.72	29.82	
2.0	11.81	3.72	31.69	
4.0	11.82	3.75	36.70	
6.0	11.84	3.78	46.72	
8.0	11.85	3.79	51.72	
10.5	11.88	3.84	67.16	

STATION	C & D 4	WEATHER	01
DEPTH	12.2 m	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	00 k
TIME	1655	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	11.84	4.22	30.84	
2.0	11.83	4.23	31.59	
4.0	11.83	4.24	32.00	
6.0	11.84	4.24	33.13	
8.0	11.86	4.31	35.55	
10.0	11.87	4.36	35.60	
11.5	11.88	4.39	100.40	

STATION	C & D 5	WEATHER	
DEPTH	12.8 m	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	
TIME	1710	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	11.86	4.59	29.65	
2.0	11.87	4.60	31.75	
4.0	11.88	4.62	31.04	
6.0	11.89	4.65	32.30	
8.0	11.90	4.74	37.88	
10.0	11.90	4.77	51.23	

STATION	C & D 6	WEATHER	01
DEPTH	11.2 m	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	
TIME	1730	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	11.87	5.11	30.84	
2.0	11.87	5.02	27.47	
4.0	11.91	5.24	46.59	
6.0	11.92	5.24	52.47	
8.0	11.93	5.26	71.04	
10.5	11.94	5.26	97.25	

STATION	C & D 7	WEATHER	01
DEPTH	10.1 m	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	
TIME	1745	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	11.89	5.23	84.94	
2.0	11.90	5.22	79.84	
4.0	11.92	5.21	120.56	
6.0	11.91	5.20	140.00	
8.0	11.92	5.20	172.68	
9.0	11.92	5.21	172.23	

STATION	C & D 8	WEATHER	00
DEPTH	11.0 m	WIND DIR	
DATE	16 Nov. '71	WIND SPEED	00 k
TIME	1805	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	11.96	4.32	139.34	
2.0	11.96	4.33	151.93	
4.0	11.98	4.35	153.74	
6.0	12.00	4.31	168.31	
8.0	12.01	4.34	174.56	
9.5	12.01	4.34	178.06	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	D R 2	WEATHER	
DEPTH	11.9 m	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	
TIME	1820	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	12.27	1.54	47.00	
2.0	12.23	1.80	62.96	
4.0	12.17	2.08	73.74	
6.0	12.17	2.07	83.37	
8.0	12.17	2.20	115.15	
9.0	12.14	2.25	157.88	

STATION	D R 3	WEATHER	00
DEPTH	13.4 m	WIND DIR.	
DATE	16 Nov. '71	WIND SPEED	00 k
TIME	1840	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	12.58	0.58	50.37	
2.0	12.58	0.58	51.64	
4.0	12.57	0.66	81.80	
6.0	12.61	0.72	75.21	
8.0	12.59	0.76	90.48	
10.0	12.58	0.77	101.53	
12.0	12.57	0.83	228.53	
13.0	12.56	0.95		

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	02
DEPTH	12.5 m	WIND DIR.	045°
DATE	14 Dec. '71	WIND SPEED	08 k
TIME	1230	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.06	0.07	45.59	
2.0	6.02	0.05	54.00	
4.0	6.02	0.09	60.89	
6.0	6.03	0.10	85.27	
8.0	6.03	0.11	84.38	
10.0	6.04	0.09	103.18	
11.5	6.04	0.06	785.94	

STATION	926 UU	WEATHER	02
DEPTH	8.0 m	WIND DIR.	045°
DATE	14 Dec. '71	WIND SPEED	08 k
TIME	1300	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.50	0.17	44.22	
2.0	5.57	0.14	46.37	
4.0	5.63	0.15	45.74	
6.5	5.63	0.17	54.97	

STATION	O T PT	WEATHER	02
DEPTH	12.8 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	06 k
TIME	1340	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	5.67	0.54	29.55	
2.0	5.72	0.56	33.82	
4.0	5.74	0.59	42.51	
6.0	5.78	0.56	44.41	
8.0	5.78	0.58		
10.0	5.79	0.57	24.55	
11.5	5.81	0.54	1026.78	

STATION	C & D 1	WEATHER	02
DEPTH	12.5 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	06 k
TIME	1405	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	5.78	0.65	28.92	
2.0	5.79	0.65	33.04	
4.0	5.79	0.64	40.05	
6.0	5.79	0.60	47.33	
8.0	5.81	0.63	49.06	
10.0	5.82	0.63	55.88	
11.5	5.86	0.64	57.72	

STATION	C & D 2	WEATHER	
DEPTH	13.4 m	WIND DIR	090°
DATE	14 Dec. '71	WIND SPEED	07 k
TIME	1430	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	5.92	0.65	37.59	
2.0	5.95	0.63	40.08	
4.0	5.96	0.63	37.38	
6.0	6.00	0.65	43.65	
8.0	6.03	0.65	46.11	
10.0	6.03	0.63	52.39	
12.0	6.03	0.63	48.16	

STATION	C & D 3	WEATHER	
DEPTH	11.6 m	WIND DIR	090°
DATE	14 Dec. '71	WIND SPEED	08 k
TIME	1450	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	5.97	0.74	55.94	
2.0	5.97	0.70	64.60	
4.0	6.05	0.67	64.90	
6.0	6.03	0.72	121.12	
8.0	6.03	0.72	120.91	
10.0	6.04	0.72	131.11	

STATION	C & D 4	WEATHER	02
DEPTH	12.5 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	07 k
TIME	1510	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	5.95	0.73	50.19	
2.0	6.00	0.73	48.67	
4.0	5.95	0.73	56.44	
6.0	5.99	0.73	56.68	
8.0	5.97	0.71	55.37	
10.0	5.99	0.73	67.18	
11.0	6.00	0.72	120.41	

STATION	C & D 5	WEATHER	02
DEPTH	12.8 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	05 k
TIME	1535	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.71	0.58	37.24	
2.0	6.68	0.55	39.55	
4.0	6.68	0.52	43.73	
6.0	6.71	0.57	58.20	
8.0	6.70	0.56	67.13	
10.0	6.72	0.57	101.92	
12.0	6.69	0.57	435.40	

STATION	C & D 6	WEATHER	02
DEPTH	10.4 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	05 k
TIME	1550	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.82	0.56	48.74	
2.0	6.79	0.55	70.42	
4.0	6.84	0.59	64.37	
6.0	6.84	0.56	98.46	
8.0	6.83	0.57	111.04	
9.0	6.82	0.57	107.61	

STATION	C & D 7	WEATHER	02
DEPTH	9.5 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	06 k
TIME	1605	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.83	0.56	84.64	
2.0	6.85	0.53	118.45	
4.0	6.86	0.56	127.78	
6.0	6.86	0.56	150.88	
8.0	6.83	0.56	145.87	

STATION	C & D 8	WEATHER	02
DEPTH	11.0 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	06 k
TIME	1620	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.90	0.44	140.55	
2.0	6.84	0.47	155.16	
4.0	6.90	0.43	155.50	
6.0	6.89	0.47	151.65	
8.0	6.90	0.48	161.53	
10.0	6.83	0.51	167.62	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	02
DEPTH	13.7 m	WIND DIR.	090°
DATE	14 Dec. '71	WIND SPEED	09 k
TIME	1630	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.77	0.13	49.00	
2.0	6.79	0.13	46.79	
4.0	6.82	0.11	68.01	
6.0	6.83	0.13	81.92	
8.0	6.83	0.11	101.58	
10.0	6.84	0.12	166.67	
12.0	6.78	0.15	246.13	

STATION	D R 3	WEATHER	02
DEPTH	14.6 m	WIND DIR.	
DATE	14 Dec. '71	WIND SPEED	
TIME	1705	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	6.55	0.08	31.38	
2.0	6.52	0.08	54.32	
4.0	6.48	0.10	67.45	
6.0	6.54	0.10	60.49	
8.0	6.53	0.10	86.94	
10.0	6.50	0.11	110.59	
12.0	6.49	0.10	159.93	
13.0	6.54	0.11	182.15	

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	00
DEPTH	12.2 m	WIND DIR.	020°
DATE	27 Jan. '72	WIND SPEED	10 k
TIME	1245	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	1.21	0.09	34.89	
2.0	1.17	0.09	48.41	
4.0	1.23	0.09		
6.0	1.18	0.09		
8.0	1.24	0.07	63.51	
10.0	1.23	0.08		
11.5	1.35	0.10		

STATION	926 UU	WEATHER	00
DEPTH	11.6 m	WIND DIR.	020°
DATE	27 Jan. '72	WIND SPEED	09 k
TIME	1320	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0			46.15	
2.0	2.15	0.10	58.67	
4.0	2.14	0.08	64.83	
6.0	2.19	0.08		
8.0	2.23	0.07	123.31	
10.5	2.35	0.08	101.06	

STATION	O T PT	WEATHER	00
DEPTH	12.8 m	WIND DIR.	020°
DATE	27 Jan. '72	WIND SPEED	07 k
TIME	1400	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0			38.92	
2.0	2.52	0.08	43.98	
4.0	2.51	0.07	53.88	
6.0	2.52	0.08	64.09	
8.0	2.52	0.08	63.94	
10.0	2.54	0.07	78.32	
11.5	2.69	0.07	81.53	

STATION	C & D 1	WEATHER	00
DEPTH	12.2 m	WIND DIR.	020°
DATE	27 Jan. '72	WIND SPEED	07 k
TIME	1425	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	2.50	0.09	34.70	
2.0	2.50	0.10	35.97	
4.0	2.49	0.10	48.00	
6.0	2.44	0.11	51.98	
8.0	2.46	0.11	75.44	
10.5	2.54	0.10	101.33	

STATION	C & D 2	WEATHER	01
DEPTH	13.4 m	WIND DIR	020°
DATE	27 Jan. '72	WIND SPEED	06 k
TIME	1455	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	2.31	0.12	48.67	
2.0	2.32	0.12	45.81	
4.0	2.31	0.12	39.82	
6.0	2.32	0.12	42.33	
8.0	2.32	0.12	49.23	
10.0	2.35	0.13	61.34	
11.5	2.47	0.12	113.60	

STATION	C & D 3	WEATHER	01
DEPTH	11.0 m	WIND DIR	020°
DATE	27 Jan. '72	WIND SPEED	06 k
TIME	1510	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	2.32	0.17	38.63	
2.0	2.32	0.21	44.54	
4.0	2.38	0.26	55.28	
6.0	2.39	0.30	61.75	
8.0	2.39	0.30	71.06	
10.5	2.47	0.27	433.40	

STATION	C & D 4	WEATHER	01
DEPTH	12.2 m	WIND DIR.	000°
DATE	27 Jan. '72	WIND SPEED	03 k
TIME	1525	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.70	0.41	65.56	
2.0	2.71	0.43	63.00	
4.0	2.70	0.42	68.86	
6.0	2.70	0.47	69.94	
8.0	2.69	0.45	76.80	
10.0	2.70	0.44	80.69	
11.0	2.75	0.42	110.23	

STATION	C & D 5	WEATHER	01
DEPTH	12.8 m	WIND DIR.	300°
DATE	27 Jan. '72	WIND SPEED	04 k
TIME	1550	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.05	0.45	80.89	
2.0	3.05	0.45	76.57	
4.0	3.05	0.43	66.52	
6.0	3.05	0.45	76.46	
8.0	3.05	0.45	109.05	
10.5	3.11	0.44	142.77	

STATION	C & D 6	WEATHER	01
DEPTH	10.4 m	WIND DIR.	350°
DATE	27 Jan. '72	WIND SPEED	04 k
TIME	1600	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.10	0.46	67.26	
2.0	3.12	0.46	67.62	
4.0	3.12	0.47	75.90	
6.0	3.12	0.48	90.12	
8.0	3.12	0.47	105.06	
10.0	3.15	0.43	152.22	

STATION	C & D 7	WEATHER	01
DEPTH	10.0 m	WIND DIR.	
DATE	27 Jan. '72	WIND SPEED	00 k
TIME	1620	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.09	0.51	144.68	
2.0	3.10	0.48	152.72	
4.0	3.10	0.47	202.19	
6.0	3.10	0.47	176.41	
8.0	3.11	0.48	194.26	
9.0	3.15	0.47	264.03	

STATION	C & D 8	WEATHER	01
DEPTH	11.0 m	WIND DIR.	
DATE	27 Jan. '72	WIND SPEED	00 k
TIME	1630	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.09	0.45	144.03	
2.0	3.11	0.44	198.91	
4.0	3.10	0.47	222.11	
6.0	3.10	0.44	273.89	
8.0	3.12	0.46	266.78	
9.0	3.16	0.46	255.59	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	01
DEPTH	14.0 m	WIND DIR.	
DATE	27 Jan. '72	WIND SPEED	00 k
TIME	1650	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	3.54	0.21	67.16	
2.0	3.57	0.21	96.54	
4.0	3.57	0.19	112.57	
6.0	3.57	0.23	127.72	
8.0	3.57	0.20	146.80	
10.0	3.57	0.21	157.51	
12.5	3.61	0.21	177.71	

STATION	D R 3	WEATHER	01
DEPTH	14.9 m	WIND DIR.	
DATE	27 Jan. '72	WIND SPEED	00 k
TIME	1700	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	4.41	0.16	42.66	
2.0	4.47	0.16	55.00	
4.0	4.50	0.14	77.41	
6.0	4.50	0.13	78.74	
8.0	4.53	0.12	94.95	
10.0	4.57	0.15	145.83	
12.0	4.58	0.15	173.14	
13.0	4.70	0.12	244.43	

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	924 QQ	WEATHER	01
DEPTH	10.1 m	WIND DIR.	210°
DATE	28 Feb. '72	WIND SPEED	07 k
TIME	1420	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.14	0.23	41.68	
2.0	2.11	0.24	47.32	
4.0	2.11	0.23	43.78	
6.0	2.13	0.27	51.01	
8.0	2.14	0.27	67.18	
10.9	2.20	0.30	131.48	

STATION	926 UU	WEATHER	01
DEPTH	12.5 m	WIND DIR.	210°
DATE	28 Feb. '72	WIND SPEED	07 k
TIME	1450	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	1.91	0.39	46.00	
2.0	1.76	0.39	69.14	
4.0	1.76	0.38	80.17	
6.0	1.78	0.40	79.27	
8.0	1.81	0.43	92.64	
9.6	1.84	0.45	91.36	

STATION	O T PT	WEATHER	01
DEPTH	12.8 m	WIND DIR.	210°
DATE	28 Feb. '72	WIND SPEED	07 k
TIME	1530	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.05	1.09	39.50	
2.0	2.05	1.08	44.50	
4.0	2.02	1.10	49.89	
6.0	2.03	1.11	60.76	
8.0	2.03	1.15	390.82	
10.3	2.07	1.13	501.25	

STATION	C & D 1	WEATHER	01
DEPTH	9.1 m	WIND DIR.	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1600	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.33	1.21	31.44	
2.0	2.23	1.21	32.80	
4.0	2.15	1.24	33.56	
6.0	2.08	1.23	36.32	
8.0	2.03	1.27	42.52	
9.9	2.04	1.30	46.02	

STATION	C & D 2	WEATHER	01
DEPTH	12.8 m	WIND DIR.	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1620	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.18	1.34	27.12	
2.0	2.10	1.38	32.20	
4.0	2.09	1.37	36.44	
6.0	2.09	1.34	37.48	
8.0	2.09	1.37	40.80	
10.0	2.11	1.40	45.36	
11.3	2.15	1.41	57.08	

STATION	C & D 3	WEATHER	01
DEPTH	12.8 m	WIND DIR.	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1640	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.11	1.47	34.68	
2.0	2.10	1.47	38.04	
4.0	2.09	1.45	39.44	
6.0	2.09	1.47	44.40	
8.0	2.10	1.48	57.28	
10.0	2.13	1.49	113.72	

STATION	C & D 4	WEATHER	01
DEPTH	12.8 m	WIND DIR.	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1650	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.18	1.59	39.29	
2.0	2.17	1.59	39.11	
4.0	2.16	1.60	43.30	
6.0	2.13	1.61	63.08	
8.0	2.12	1.61	76.70	
10.5	2.14	1.61	97.71	

STATION	C & D 5	WEATHER	01
DEPTH	13.1 m	WIND DIR.	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1708	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.26	1.96	47.72	
2.0	2.24	1.93	43.41	
4.0	2.22	1.92	42.73	
6.0	2.20	1.95	41.48	
8.0	2.19	2.03	77.61	
10.0	2.20	2.09	128.84	
12.0	2.24	2.11	318.75	

STATION	C & D 6	WEATHER	01
DEPTH	11.0 m	WIND DIR.	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1730	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.28	2.21	38.13	
2.0	2.26	2.29	48.08	
4.0	2.26	2.40	121.77	
6.0	2.28	2.40	115.18	
8.0	2.33	2.49	111.81	
10.6	2.39	2.52	163.77	

STATION	C & D 7	WEATHER	01
DEPTH	9.8 m	WIND DIR.	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1745	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.65	3.01	116.87	
2.0	2.60	3.03	159.36	
4.0	2.62	3.08	248.41	
6.0	2.59	3.10	309.64	
8.5	2.63	3.12	406.04	

STATION	C & D 8	WEATHER	01
DEPTH	11.0 m	WIND DIR	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1755	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.64	3.31	142.07	
2.0	2.65	3.31	140.85	
4.0	2.64	3.31	150.45	
6.0	2.65	3.31	159.11	
8.0	2.64	3.29	168.14	
10.0	2.65	3.28	224.85	

STATION	D R 1	WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION	D R 2	WEATHER	01
DEPTH	14.6 m	WIND DIR	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1810	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	3.01	1.01	94.29	
2.0	3.03	1.05	108.49	
4.0	3.04	1.06	108.52	
6.0	2.99	1.07	120.76	
8.0	3.03	1.04	148.47	
10.0	3.03	1.13	194.77	
12.0	3.06	1.12	441.50	

STATION	D R 3	WEATHER	01
DEPTH	13.4 m	WIND DIR	
DATE	28 Feb. '72	WIND SPEED	00 k
TIME	1845	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	3.51	0.24	134.86	
2.0	3.44	0.24	137.67	
4.0	3.46	0.24	132.31	
6.0	3.43	0.24	138.42	
8.0	3.48	0.21	142.10	
10.0	3.48	0.22	147.32	
12.0	3.47	0.22	145.34	
14.0	3.52	0.24	154.01	

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	924 QQ	WEATHER	06
DEPTH	11.0 m	WIND DIR.	140°
DATE	14 Feb. '73	WIND SPEED	06 k
TIME	1335	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	1.21	0.20	36.21	
2.0	1.20	0.31	40.09	
4.0	1.18	0.33	46.42	
6.0	1.20	0.43	47.47	
8.0	1.23	0.60	61.76	
10.0	1.47	1.54	57.63	

STATION	926 UU	WEATHER	06
DEPTH	11.6 m	WIND DIR.	140°
DATE	14 Feb. '73	WIND SPEED	05 k
TIME	1405	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	1.19	0.31		
2.0	1.17	0.31		
4.0	1.21	0.49		
6.0	1.23	0.51		
8.0	1.27	0.60		
10.0	1.27	0.81		

STATION	O T PT	WEATHER	
DEPTH	13.5 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	05 k
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	1.64	0.79	63.07	
2.0	1.62	0.70		
4.0	1.62	0.54	68.15	
6.0	1.63	0.49	68.53	
8.0	1.61	0.46		
10.0	1.62	0.40	74.47	
12.0	1.64	0.50	83.06	
13.5	1.67	0.50	84.57	

STATION	C & D 1	WEATHER	06
DEPTH	12.2 m	WIND DIR.	050°
DATE	14 Feb. '73	WIND SPEED	05 k
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	1.78	1.04	55.92	
2.0	1.77	1.01	59.98	
4.0	1.79	1.07	60.09	
6.0	1.82	1.06	69.94	
8.0	1.85	1.03	87.14	
10.0	1.85	1.01	94.80	
12.0	1.86	0.90	114.56	

STATION	C & D 2	WEATHER	06
DEPTH	12.1 m	WIND DIR	090°
DATE	14 Feb. '73	WIND SPEED	09 k
TIME	1530	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	1.86	0.76	103.71	
2.0	1.87	0.99	98.13	
4.0	1.87	0.98	106.26	
6.0	1.87	0.99	104.32	
8.0	1.87	0.85	133.56	
10.0	1.89	0.89	130.58	
12.0	1.88	0.87	138.34	

STATION	C & D 3	WEATHER	06
DEPTH	13.0 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	09 k
TIME	1550	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	1.98	0.69	77.43	
2.0	1.87	0.67	53.24	
4.0	1.88	0.69	117.21	
6.0	1.88	0.69	164.77	
8.0	1.88	0.67	191.20	
10.0	1.89	0.71	253.52	
12.0	1.84	0.73		
13.0	1.86	0.69	1135.35	

STATION	C & D 4	WEATHER	06
DEPTH	12.2 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	09 k
TIME	1605	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	1.88	0.61	148.69	
2.0	1.89	0.66	157.51	
4.0	1.90	0.58	169.66	
6.0	1.91	0.60		
8.0	1.91	0.64	303.80	
10.0	1.95	0.67	188.26	
12.0	1.93	0.69	2245.98	

STATION	C & D 5	WEATHER	06
DEPTH	10.8 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	08 k
TIME	1625	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	2.03	0.76	137.81	
2.0	2.02	0.75	174.70	
4.0	2.04	0.87	201.43	
6.0	2.04	0.82	203.83	
8.0	2.05	0.86	212.27	
10.0	2.05	0.89	204.65	

STATION	C & D 6	WEATHER	06
DEPTH	11.8 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	07 k
TIME	1639	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	2.08	0.90	238.38	
2.0	2.08	0.91	214.17	
4.0	2.10	0.97	343.34	
6.0	2.09	0.94	298.30	
8.0	2.11	1.03	455.81	
10.0	2.12	1.05	471.43	
11.5	2.12	0.97	588.51	

STATION	C & D 7	WEATHER	06
DEPTH	11.8 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	05 k
TIME	1700	SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)
0.0	2.16	1.62	182.04	
2.0	2.18	1.66	234.37	
4.0	2.18	1.72	229.12	
6.0	2.19	1.79	239.01	
8.0	2.22	1.08	252.21	
10.0	2.23	2.08	251.25	
11.5	2.25	2.14	546.65	

STATION	C & D 8	WEATHER	06
DEPTH	12.2 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	05 k
TIME	1720	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	D R 1	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	D R 2	WEATHER	06
DEPTH	12.7 m	WIND DIR.	090°
DATE	14 Feb. '73	WIND SPEED	10 k
TIME	1733	SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	2.65	0.43	81.15	
2.0	2.66	0.52	91.63	
4.0	2.61	0.92	128.09	
6.0	2.55	1.34	176.32	
8.0	2.59	1.14	185.53	
10.0	2.52	1.70	248.96	
12.5	2.55	1.32	289.52	

STATION	D R 3	WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER	
DEPTH		WIND DIR.	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION		WEATHER	
DEPTH		WIND DIR	
DATE		WIND SPEED	
TIME		SECCHI DISK	

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	924 QQ	WEATHER
DEPTH	10 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1345	SECCHI DISK 11 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.10	2.11	5.07	
2.0	17.83	2.54	4.96	
4.0	17.96	4.29	5.18	
6.0	18.05	4.70	15.24	
8.0	18.12	5.01	21.66	
9.0	18.17	5.35	38.40	

STATION	926 UU	WEATHER
DEPTH	10.5 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1415	SECCHI DISK 9 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.17	4.87	6.91	
2.0	18.19	5.66	19.81	
4.0	18.16	6.16	32.02	
6.0	18.16	6.40	53.86	
8.0	18.16	6.53	50.35	
9.0			52.66	
10.0	18.14	6.54		

STATION	O T PT	WEATHER
DEPTH	12.5 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1450	SECCHI DISK 60 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.16	6.91	20.69	
2.0	18.16	7.23	24.06	
4.0	18.16	7.31	27.35	
6.0	18.17	7.33	35.21	
8.0	18.18	7.37	32.90	
10.0	18.19	7.41	35.94	
12.0	18.19	7.48	48.61	

STATION	C & D 1	WEATHER
DEPTH	12.2 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1510	SECCHI DISK 60 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.33	7.65	22.87	
2.0	18.32	7.73	26.19	
4.0	18.30	7.76	26.80	
6.0	18.29	7.81	37.30	
8.0	18.28	7.82	37.95	
10.0	18.27	7.82	40.71	
12.0	18.25	7.82	65.51	

STATION	C & D 2	WEATHER
DEPTH	12.2 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1530	SECCHI DISK 60 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.38	7.57	29.37	
2.0	18.37	7.58	28.89	
4.0	18.37	7.58	35.23	
6.0	18.36	7.58	39.89	
8.0	18.35	7.59	38.45	
10.0	18.34	7.59	86.14	
12.0			158.69	

STATION	C & D 3	WEATHER
DEPTH	10.2 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1650	SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.39	7.65	23.02	
2.0	18.38	7.65	25.57	
4.0	18.38	7.66	25.09	
6.0	18.38	7.68	27.53	
8.0	18.36	7.70	42.22	
10.0	18.33	7.71	105.72	

STATION	C & D 4	WEATHER
DEPTH	12.2 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1605	SECCHI DISK 65 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.33	7.99	20.07	
2.0	18.33	7.99	23.33	
4.0	18.32	7.99	24.04	
6.0	18.30	8.00	46.55	
8.0	18.27	8.00	78.61	
10.0	18.25	8.01	128.83	
12.0	18.21	8.02	396.49	

STATION	C & D 5	WEATHER
DEPTH	12.2 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1620	SECCHI DISK 60 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.19	7.85	25.89	
2.0	18.20	7.87	43.49	
4.0	18.19	7.87	38.47	
6.0	18.17	7.86	74.38	
8.0	18.16	7.87	94.57	
10.0	18.14	7.87	176.25	
12.0	18.03	7.89	273.22	

STATION	C & D 6	WEATHER
DEPTH	10.3 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1635	SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.15	7.97	19.58	
2.0	18.15	7.96	129.78	
4.0	18.14	7.96	120.81	
6.0	18.13	7.97	111.49	
8.0	18.11	7.98	148.65	
10.0	18.08	8.00	264.18	

STATION	C & D 7	WEATHER
DEPTH	8.2 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1660	SECCHI DISK 45 cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.18	8.43	53.37	
2.0	18.18	8.43		
4.0	18.17	8.43	76.30	
6.0	18.16	8.42	96.70	
8.0	18.15	8.42	135.04	

STATION	C & D 8	WEATHER
DEPTH	10.1 m	WIND DIR
DATE	5 Oct. '76	WIND SPEED
TIME	1750	SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.28	7.88	34.88	
2.0	18.24	7.94	49.93	
4.0	18.22	8.04	47.07	
6.0	18.19	8.25	163.84	
8.0	18.15	8.29	220.89	
10.0	18.11	8.32		

STATION	D R 1	WEATHER
DEPTH		WIND DIR
DATE		WIND SPEED
TIME		SECCHI DISK

DEPTH (m)	TEMP (C)	SAL (‰)	SUSP SED (mg/l)	COMB ORG (%)

STATION	D R 2	WEATHER
DEPTH	12.1 m	WIND DIR.
DATE	5 Oct. '76	WIND SPEED
TIME	1715	SECCHI DISK 45cm

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)
0.0	18.43	3.92	30.68	
2.0	18.41	4.85	40.78	
4.0	18.39	5.30	45.60	
6.0	18.39	5.72	71.26	
8.0	18.42	5.85	75.55	
10.0	18.65	6.19	109.43	
12.0	18.10	7.48	342.35	

STATION	D R 3	WEATHER
DEPTH		WIND DIR.
DATE		WIND SPEED
TIME		SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER
DEPTH		WIND DIR.
DATE		WIND SPEED
TIME		SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER
DEPTH		WIND DIR.
DATE		WIND SPEED
TIME		SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER
DEPTH		WIND DIR.
DATE		WIND SPEED
TIME		SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)

STATION		WEATHER
DEPTH		WIND DIR.
DATE		WIND SPEED
TIME		SECCHI DISK

DEPTH (m)	TEMP. (C)	SAL. (‰)	SUSP. SED. (mg/l)	COMB. ORG. (%)